

UNITED STATES DISTRICT COURT
EASTERN DISTRICT OF PENNSYLVANIA

AC2T, Inc., d/b/a
Spartan Mosquito,

Case No. 2:19-cv-5946-RBS

Plaintiff

v.

Colin Purrington,

Defendant

DEFENDANT'S ANSWER WITH NEW MATTER AND COUNTERCLAIM

Defendant Colin Purrington, PhD., by and through his attorney, Trevor C. Serine, Esquire, files this Answer with New Matter and Counterclaim to the First Amended Complaint of Plaintiff AC2T, Inc. ("Spartan") pursuant to 27 Pa. C.S.A. § 8301 *et seq.*, the *Noerr-Pennington* Doctrine on the First Amendment protections, 42 Pa. C.S.A. §8342 *et seq.*, and the common laws of this Commonwealth, pleading as follows:

1. Admitted to the extent that business records reflect that Spartan is a Mississippi Company.
2. Admitted to the extent that Defendant Colin Purrington, PhD, holds a doctorate in biology, completed an undergraduate entomology course, and currently publishes an environmental blog (founded in 2011) and resides in Swarthmore, Pennsylvania.
3. Denied. The Court lacks subject matter jurisdiction under 28 U.S.C. §1332 because the amount in controversy does not exceed \$75,000.00 – in fact, Plaintiff cannot identify, and has not pled, a single monetary harm to its business. Moreover, Spartan is not authorized to distribute the "Mosquito Eradicator" within the Commonwealth of Pennsylvania, as it apparently voluntarily withdrew its

registration with the Pennsylvania Department of Agriculture due to its inability to “address [the Pa Dept. of Agriculture] identified problems,” reproduced here:

PA STATE AGENCIES ONLINE SERVICES
Tom Wolf, Governor

Pesticide Registrant Brand Information

Company Details

008AHV | AC2T Inc d/b/a Spartan Mosquito | Attn Joshua Mars, PO Box 18556, Hattiesburg, MS 39404 | P1: 601-427-1405

Program Status: Active

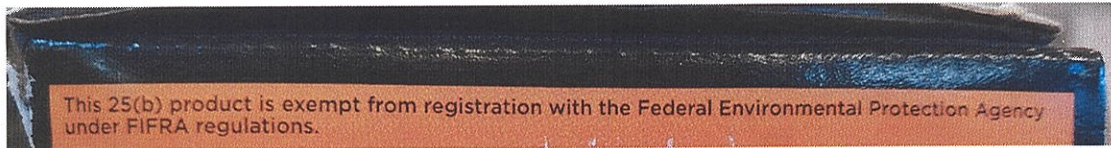
Brand Details

Brand Name:	Spartan Mosquito Eradicator		
Brand ID:	35610	Registration Fiscal Year:	2019
Type:	Pesticide Registrant	Status:	Active
Issue Date:	11/19/2018	Dual Brand:	No
Original Effective Date:	02/06/2018		
25(b):	Yes		
EPA Number:	99999-99999		
Class:			
Toxicity:			
Brand Purpose:	Not Available		
Additional Information:	paper 2021 renewal voluntarily withheld by registrant pending address of PDA's identified problems		

The “Eradicator” is now illegal to sell or ship to this Commonwealth pursuant to the Pa. Pesticide Control Act, in addition to being banned or prohibited from sale in a dozen other states. Further, upon information and belief Spartan no longer manufactures or sells the “Eradicator,” and cannot identify any harm or damages resulting from any statements from the Defendant and is not entitled to relief. *See, e.g., Williams v. Best Buy Co.*, 269 F.3d 1316, 1321 (11th Cir. 2001); Pesticide Registrant Brand Information, *Pennsylvania Bureau of Plant Industry*, <https://paplants.pa.gov/ProductRegFSA/Brandinfo.aspx>.

4. Admitted.
5. Denied in part. This statement is demonstrably false, i.e., that the product is “government regulated” (and which is repeated *ad nauseum* throughout the Complaint). Yet, on the retail box containing the “Eradicator,” it states: “this

25(b) product is exempt from registration with the Federal Environmental Protection Agency under FIFRA [regulations].”



According to the label on its own product, it is not regulated by the EPA. Thus, the averments by Spartan regarding government regulation are knowingly false – Spartan specifically applied for an exemption from FIFRA regulations under 40 C.F.R. §152.25(f)(1). Thus, the averment that “the product is government regulated” implying federal EPA review or approval, is false, malicious, and made in bad faith – the “Eradicator” is specifically exempt from regulation by the EPA under FIFRA.

It is admitted to the extent that Defendant repeatedly engaged with state and federal regulatory agencies, and petitioned his government and encouraged others to do so regarding the Spartan “Eradicator.” Spartan manufactured, at one point, a product called the “Mosquito Eradicator” which it claimed was scientifically proven to be “uniquely effective, long-lasting, continues mosquito control system.” Spartan stated within its advertisements and upon its packaging and labeling that “the mosquito population...will be 95% controlled for up to 90 days.” It is denied that any statements were untrue or defamatory – the statements were true, protected by Statutory Immunity, and otherwise merely opinions, scientific deductions, or protected speech. Indeed, a class action has been filed in

New York¹ against Spartan for fraudulent misrepresentation, false advertising, and product liability regarding the claims of Spartan for its “Eradicator.”

It is further specifically denied that the “Eradicator” contained a pesticide, as falsely alleged within this Paragraph – pesticides and active ingredients are strictly defined and regulated by the EPA and Congress under 7 U.S. § 136². The “Eradicator” was submitted to the EPA by Spartan and specifically granted a use only under “FIFRA exempt” designation pursuant to 40 C.F.R. § 152.25³. According to Spartan’s registration with the Commonwealth of PA, (PA Product No.: 35610), it lists no active ingredient or pesticide. NPIRS Public Report reproduced here:

PENNSYLVANIA STATE PRODUCT REPORT

Company Number: 803

*denotes ALSTAR label is available

AC2T Inc d/b/a Spartan Mosquito

Attn Joshua Mars

PO Box 18556

Hattiesburg MS 39404

Number of Currently Registered Products: 3

SPARTAN GO

EPA Registration Number: 93362-1-93813 PA Product Number: 40851 Registration Year: 2021

Percent Active Ingredient

20.0000 Picaridin (70705)

SPARTAN MOSQUITO PRO TECH

EPA Registration Number: 93813-1 PA Product Number: 41440 Registration Year: 2021

Percent Active Ingredient

9.0400 Boric acid (11001)

SPARTAN MOSQUITO ERADICATOR

EPA Registration Number: 99999-99999 PA Product Number: 35610 Registration Year: 2020

Percent Active Ingredient

No ingredient data available.

Moreover, Spartan stated that there are only three (3) ingredients within its “Eradicator” – 88.34% Sugars, 11.48% Salt, and .18% Yeast [CAS#68425-17-2;

1 Consolazio, etal v. AC2T. INC, Bonner Analytical Testing Co., and Jeremy Hirsch, 1:20-cv-03477, S.D. N.Y. 2020.

2 7 U.S. § 136(a) – “Active Ingredient means (1) in the case of a pesticide... an ingredient which will prevent, destroy, repel, or mitigate any pest.”

3 40 C.F.R. § 152.25(f) minimum risk pesticides; see (2) permitted inert ingredients.

CAS# 7647-14-5; CAS#688876-77-7]. All are designated by the EPA to be “inert ingredients,” hence, exempt from regulation.

Table 2 – Inert Ingredients Permitted in Minimum Risk Pesticides⁴:

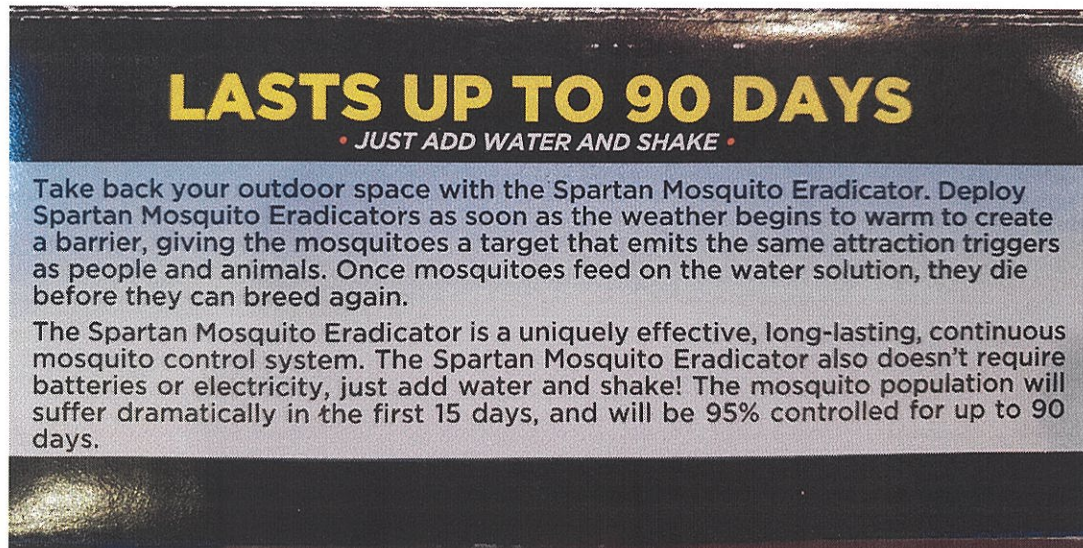
TABLE 2 – INERT INGREDIENTS PERMITTED IN MINIMUM RISK PESTICIDE PRODUCTS

Label display name	Chemical name	CAS No.
Syrups, hydrolyzed starch, hydrogenated	Syrups, hydrolyzed starch, hydrogenated	68425-17-2
Sodium chloride	Sodium chloride	7647-14-5
Yeast	Yeast	68876-77-7

Thus, the “Eradicator” contains no true active ingredient pesticide, and therefore this averment is knowingly false. See 7 U.S. § 136(a). Further, none of the three ingredients, Yeast, Sugar, or Salt, “prevent, destroy, repel, or mitigate” mosquitoes – indeed, the Yeast feeds upon the Sugar to create Carbon-Dioxide [CAS# 124-38-9], another inert ingredient upon the aforementioned Table 2 – *attracting* mosquitoes *without mitigation*. See 40 C.F.R. §152.25(f)(2)(iv). Interestingly, Jeremy Hirsch has personally admitted in written communications to state regulatory agents that his product only produces CO₂ for at most, “**a few days vs. just a few hours...with the addition of salt in specific quantities (such as in the Eradicators).**”⁵ No facts or evidence supplied by the Plaintiff demonstrates the “Eradicator” actually prevents, destroys, repels, or mitigates mosquitoes.

⁴ 40 C.F.R. Section 152.25(f)(s)(iv), consolidated.

⁵ Letter from Jeremy Hirsch, President of AC2T, Inc. October, 2019 to the Indiana Office of Pesticide Registration.



Here, Spartan is claiming on its box that it creates a “barrier,” attracting mosquitoes and killing them. Claims of “barriers” are explicitly not permitted with any type of toxicant, and may only be used by “products that are intended to exclude pests only by providing a physical barrier against pest access, and which contain no toxicants, such as certain pruning paints to trees.” 40 C.F.R. 152.10(c). Moreover, Jeremy Hirsch has personally admitted in written communications to state regulatory agents that his product is potentially misleading to the average consumer - “We are completely open to changing the layman’s expression of how mosquitoes die because of our devises, but based on known science, we figured this was a fair and balanced explanation for the average consumer.”⁶ Thus, as a matter of fact and law, Spartan is in violation of federal regulations, and the statements of the Defendant are true. Further, the theoretical reason behind the company seeking a FIFRA-exempt designation for its product is clearly an opinion of the Defendant and is in no way defamatory.

⁶ Letter from Jeremy Hirsch, President of AC2T, Inc. October, 2019 to the Indiana Office of Pesticide Registration.

Finally, communications to state regulatory agencies and third parties are constitutionally protected, and this Complaint is merely an illegal attempt to silence or otherwise chill the speech of a concerned scientist, the Defendant herein, petitioning his government and regulatory bodies, in violation of the Anti-SLAPP Act. See, The Participation in Environmental Law or Regulation Act, 27 Pa. C.S. §8301, *et seq.*; see also, Penllyn Greene Associates, LP v. Clouser, 890 A.2d 424, (Pa. Cmwh. 2005).

6. Denied as stated. It is admitted that Defendant submitted dozens of comments to public agencies, non-profits, state and federal regulators, and petitioned the public to boycott or otherwise report the “Eradicator” to their respective state regulatory body. It is denied these statements were defamatory; these statements are granted immunity by the Constitution of this Commonwealth, are true or reasonably true, are opinions of the Defendant, and are protected speech under the First Amendment of the Federal Constitution. See 27 Pa. C.S. §8301 et seq.; Penllyn, 890 A.2d 424, *supra*; 42 Pa. C.S. §8342, *et seq.* Following the reports and petitions to the state and federal agencies, the “Eradicator” product was banned for sale to the public in at least eleven (11) states, Puerto Rico, and the District of Colombia, including this Commonwealth, until Spartan withdrew it from the market.

7. Admitted to the extent that the Defendant is a PhD. biologist and retired biology professor previously employed at Swarthmore College. It is admitted that Defendant used his rigorous scientific education and knowledge of the scientific

method to conduct evaluations of the “Eradicator” he purchased, which he then published on his blog, demonstrated conclusively to him that the “Eradicator” product did not attract or kill mosquitoes – and certainly not “95% for 90 days.” Defendant submitted the data and comments to state and federal environmental agencies. Moreover, in his statement, Defendant opined about the scientific consensus – a consensus, defined by Merriam-Webster’s Dictionary defines it as: “1. General Agreement about something, an idea or opinion that is shared by all the people in a group.” Here, there are no independent scientific studies which support the “Eradicator” toxic salt/yeast bait trap, and Spartan cannot point to a single independent study, nor provides any scientific internal data, to demonstrate its “Eradicator” trap can successfully kill 95% of mosquitoes for a period of 90 days. Conversely, Defendant can cite numerous peer-reviewed⁷ ⁸and independent studies⁹ which conclusively prove the scientific consensus that toxic salt/yeast bait mosquito traps are entirely ineffective for essentially any period of days. A seminal report (Yee, 2020) published in the *Journal of Medical Entomology*, authored by a team of scientists led by the University of Southern Mississippi at Hattiesburg (the home state and town of the Plaintiff) in conjunction with: the University of Sydney Medical School and the New South Wales Health Pathology

7 Yee, D.A., Dean, C., Webb, C., Henke, J.A., Perezchica-Harvey, G., White, G.S., Faraji, A., Macaluso, J.D., & Christofferson, R. (2020). No Evidence that Salt Water Ingestion Kills Adult Mosquitoes (Diptera: culicidae). *Journal of Medical Entomology*, 58(2), 767-772. - See Exhibit “A”

8 Patrick, Marjorie & Aimanova, Karlygash & Sanders, Heather & Gill, Sarjeet. (2007). P-type Na⁺/K⁺-ATPase and V-type H⁺-ATPase expression patterns in the osmoregulatory organs of larval and adult mosquito *Aedes aegypti*. *The Journal of Experimental Biology*. 209. 4638-51. 10.1242/jeb.02551.

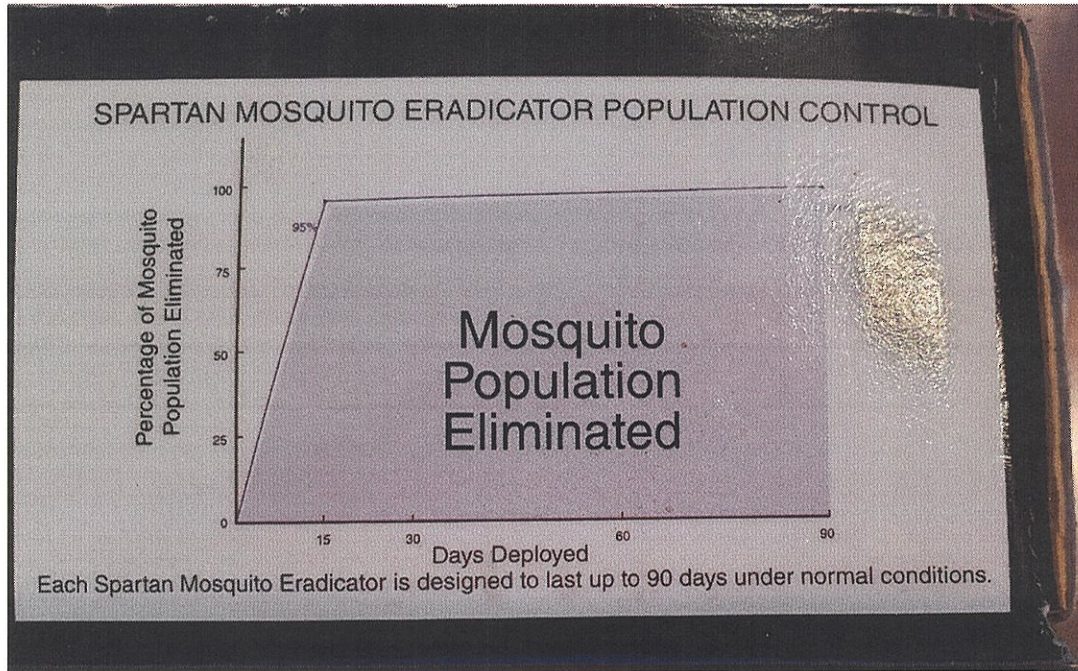
9 Aryaprema, V.S., Zeszutko, E., Cunningham, C., Khater, E.I.M. & Xue, R. (2020). Efficacy of Commercial Attractive Toxic Sugar Bait Station (ATSB) Against *Aedes albopictus*. *Journal of the Florida Mosquito Control Association*, 67, 80-83. - See Exhibit “B”

Hospital, both in Australia; Coachella Valley Mosquito Control in Indio, California; Salt Lake City Mosquito Abatement District of Utah; and, the School of Veterinary Medicine of Louisiana State University in Louisiana, found that toxic salt bait traps are not effective for mosquito control or reduction and have zero scientific basis.

Therefore, the statement that there is a scientific consensus against these types of toxic salt/yeast bait “Eradicator” products, is unequivocally true.

8. Denied. This averment constitutes an incorrect conclusion or proposition of law to which no response is required. Further, the statements made by the Defendant are true, reasonably true, covered by immunity, are opinions or deductions of the Defendant, are based upon personally observed scientific testing of the product, and are protected by the First Amendment. Further, the Plaintiff cannot show facts, data, testimony, and has not pled any evidence, that the “Eradicator” is 95% effective for up to 90 days. Further, Plaintiff specifically makes repeated unsupported claims regarding the ability of the “Eradicator” to control mosquito-borne diseases - thus the response from the Defendant is logical, truthful, and merely a deductively-reasoned opinion based upon unsupported, unscientific statements regarding the “Eradicator.” Defendant supported his statements with video evidence and efficacy data, and specifically communicated these findings to state, federal, and non-profit agencies and petitioned the public for action.

9. Admitted to the extent that Spartan, at one point, manufactured the “Eradicator” product at issue herein, claiming it can “eliminate 95% of the mosquito population for up to 90 days” [emphasis supplied].



False and misleading statements on a label are a breach of EPA conditions. See 40 CFR 156.10(a)(5)(i) – (viii).

10. Denied as stated. The “Eradicator” on its face cannot be designed to “substantially reduce a local mosquito population” when it contains no active ingredients and has zero independent scientific basis for said claim. Indeed, within the *Journal of Medical Entomology*, Yee stated, “there are no known scientific efficacy data to that support these claims [that ingestion of salt will significantly reduce populations of wild mosquitoes].”¹⁰ The Spartan claims regarding the

¹⁰ Yee, D.A., Dean, C., Webb, C., Henke, J.A., Perezchica-Harvey, G., White, G.S., Faraji, A., Macaluso, J.D., & Christofferson, R. (2020). No Evidence that Salt Water Ingestion Kills Adult Mosquitoes (Diptera: culicidae). *Journal of Medical Entomology*, 58(2), 767-772.

“Eradicator” constitute false advertising. Indeed, Spartan claims that, “we tested it from the Atlantic to the Pacific and beyond, from the marshes in Florida to the bayous in Louisiana, and everywhere we test, it works phenomenal...in every case, mosquito ‘hits’ are reduced to near zero, or zero, within weeks or even days.”¹¹

Defendant specifically reported these false advertising concerns to the FTC.

11. Admitted to the extent that the Defendant is a PhD. biologist and retired biology professor previously employed at Swarthmore College. Defendant used the scientific method to evaluate the “Eradicator” in tests, which demonstrated conclusively to him that the “Eradicator” product did not kill mosquitoes in any sense of the word – and certainly not “95% for 90 days.”

12. Denied. This averment constitutes an incorrect conclusion or proposition of law to which no response is required. Further, Defendant made no defamatory statements; the statements were all true, or reasonably true, granted immunity by the Constitution of this Commonwealth, are opinions of the Defendant, and are protected speech under the First Amendment of the Federal Constitution.

13. Admitted to the extent that Defendant opined that, after his scientific evaluation of the product, the “Eradicator” was a “scam,” as it did not function according to its stated purpose and advertising. Spartan, upon information and belief, no longer sells the “Eradicator,” an acknowledgment by the Plaintiff that its product, the “Eradicator” is not effective at controlling mosquito-borne diseases.

¹¹ Hattiesburg Man Invents Product to Control Mosquitoes. WDAM. May 12, 2017. - See “Exhibit “C”

14. Denied. This statement by the Defendant is clearly an opinion (and which also is truthful) that a product advertised to “eliminate 95% of mosquitoes,” that does not work as advertised, increases the risk of mosquito-borne illnesses, due to the incorrect belief of the consumer that they are protected by “elimination.” The product is even inappropriately named “Eradicator” to convince the consumer that it actually removes or eliminates pests. The product's label even shows an anthropomorphic representation of its device protecting a young family and its beloved dog:



More importantly, these comments were in direct response to the Plaintiff's public relations campaign that its “Eradicator” can help control the spread of mosquito-borne diseases – i.e., the Plaintiff has “invited” the comments by making unsupported, wildly illogical and unscientific claims regarding its “Eradicator” product. Jeremy Hirsch and Spartan have been engaged in a public relations campaign since at least May of 2017 to explicitly convince the public that its “Eradicator” product was effective at reducing mosquitoes that carry Zika and/or

other mosquito-borne illnesses.¹² Some of Jeremy Hirsch's various PR statements regarding the "Eradicator" -- **"the most successful response to Zika anywhere in the world on record"**¹³, and, "anyone can use this from municipalities to..residential is really what we care about most...**it was founded to keep my family safe. The point of this is to keep everybody's family safe**¹⁴" and "by bringing a product to market that is **better than sprays, repellents, candles, and repellent services**, at a price point that is a fraction of the cost of professional spray services, we have opened up the market¹⁵" It is a violation of EPA Condition 4 for a product claiming to control or mitigate insects...carrying specific diseases." See EPA 25(b) Condition 4¹⁶.

Defendant's statements specifically responded to the perceived threat to the public if the "Eradicator" was distributed as a mosquito-borne disease prevention tool – which is exactly what Spartan is attempting to do.

15. Denied. This averment constitutes an incorrect conclusion or proposition of law to which no response is required. Further, the statement is true, reasonably true, and may contain opinion – but is entirely based upon the scientific tests performed by the Defendant personally. In his studies and observations, mosquitoes in the wild were not able or not willing to enter the holes provided upon the "Eradicator." Defendant stated that he tested the product and did not find

¹² Hattiesburg Man Invents Product to Control Mosquitoes. WDAM. May 12, 2017.

¹³ Hattiesburg Man Invents Product to Control Mosquitoes. WDAM. May 12, 2017.

¹⁴ Hattiesburg Man Invents Product to Control Mosquitoes. WDAM. May 12, 2017.

¹⁵ Carter, B. Spartan Mosquito Eradicator. *Manufactured in Mississippi*. <https://manufacturedinmississippi.com/> - See Exhibit "D"

¹⁶ <https://www.epa.gov/minimum-risk-pesticides/conditions-minimum-risk-pesticides>

that the target adult mosquitoes entered same – concluding that they were unable or unwilling to enter. The results of this experiment are consistent with the results from a study published by Dickerson (2018), *Journal of Insect Science*, which confirmed that mosquitoes don't squeeze "through 8 mm gaps even though they physically can."¹⁷ [The holes for the "eradicator" purchased by the Defendant are **4 mm**, according to Spartan]. The Defendant's statements are therefore true and consistent with all available published science. More importantly, whether or not the target mosquitoes can enter or exit with ease is entirely irrelevant if the bait within the "Eradicator" contains no active ingredient and has no verified efficacy – here, the "Eradicator," by the admission of Spartan, contains no active ingredient, is not regulated by any Federal agency, and its claims of 95% elimination for up to 90 days is unsupported by any known independent scientific literature.

16. Denied as stated. Plaintiff alleges that its "Eradicator" product can "eliminate 95% of mosquitoes for up to 90 days;" however, all scientific literature to date shows that the small amount of yeast and sugar included within the "Eradicator" cannot physically create enough carbon-dioxide to attract mosquitoes for 90 days – it is literally impossible for the biochemical reaction of the yeast to continue for 90 days with the amount of sugar provided. See, e.g., Yee, *Supra*; Aryaprema, *Supra*. Thus, the statement - that the "Eradicator" does not work to "attract mosquitoes" is true and supported by numerous studies.

17 Andrew K Dickerson, Alexander Olvera, Yva Luc, Void Entry by *Aedes aegypti* (Diptera: Culicidae) Mosquitoes Is Lower Than Would Be Expected by a Randomized Search, *Journal of Insect Science*, Volume 18, Issue 6, November 2018, 9, <https://doi.org/10.1093/jisesa/iey115>

17. Admitted to the extent that Defendant opined that, after his scientific evaluation of the product, it was a “scam,” as the “Eradicator” did not function according to its stated purpose and advertising. “Scam” is clearly an opinion, and is a colloquial reference to a product that does not work as advertised. Here, simple physics, as well as all independent scientific literature to date, demonstrates that the “Eradicator” cannot work as advertised, and therefore is reasonably considered a “scam.”
18. Admitted to the extent that the Defendant is, in fact, a scientist – a true statement. Admitted also to the extent that the Defendant, in fact, evaluated the product extensively – a true statement. It is admitted that the Defendant corresponded with dozens of state and federal agencies, regulators and health officials, including **all 50 States environmental agencies**, D.C., PR, and including the EPA, EPA regions 2-9, EPA northwest, as well as contacted numerous non-profits (such as the Mosquito Illness Alliance, American Mosquito Control Association), had discussions with dozens of scientists, petitioned publicly and to private citizens, and the like – at minimum, a reasonably true statement. While an exact count, such as 100, may be *slight* hyperbole – it is un-contradicted that the Defendant did in fact contact dozens of state and federal agencies and regulators, non-profits, independent scientists, etc. Moreover, nothing about the statement, “I corresponded with over 100 scientists and public health officials” is defamatory to the Plaintiff – the statement is simply an estimation of the efforts the Defendant went through to petition his government and to educate himself on

the current literature regarding the efficacy of so-called “toxic” salt/yeast-bait traps – indeed, there is no independent scientific basis whatsoever, and Plaintiff identifies none, for the “95% reduction for up to 90 days” claim made by Spartan regarding the “Eradicator.”

19. Denied. This averment constitutes an incorrect conclusion or proposition of law to which no response is required. Further, this statement is an observed scientific deduction and/or opinion of the Defendant regarding the lack of efficacy of the “Eradicator” product. Moreover, it contained a follow-up which directed the statement specifically to the attention of a Mississippi entomologist – thus provided immunity under the PA Constitution regardless of its quality. See 27 Pa. C.S. § 8301, *et. seq.* In essence, Defendant logically deduces that if the product does not reduce mosquitoes but is actively attracting different invasive insects which then are able to breed within the brew inside the “Eradicator,” then deploying the “Eradicators” in fact draws the invasive insect to the area without eliminating it – thus contributing to the potential spread of the invasive species. This statement is based upon the Defendant field-testing the product and discovering live, active larva of the spotted-wing drosophila – thus, is true.

20. Denied. This averment constitutes a series of incorrect conclusions or propositions of law to which no response is required. Further, the statement, “loophole” is not defamatory in any way, and is clearly an opinion. The word loophole is merely a colloquial term, defined by Mirriam-Webster as: “an ambiguity or omission in a text through which the intent of a statute, contract, or

obligation may be evaded.” [emphasis supplied] Here, Defendant found that the “Eradicator” product did not “eliminate 95% of mosquitoes for up to 90 days,” and that Spartan advertised the “Eradicator” as a “mosquito control device” and as a “barrier.” The intent of the EPA, Congress, and state regulators and agencies is to register and approve/disprove safe, effective pesticide products and active ingredients for pest control. Spartan applied for EPA Regulation under an exemption to this flat rule, pursuant to 40 C.F.R. §152.25(f)(1) – Exempted products, and does not require federal registration under FIFRA. See 40 C.F.R. §152.25(f)(1). Indeed, the EPA Registration Number for the “Eradicator” is listed as 99999-99999, i.e., not regulated by the EPA, and lists no active ingredient, i.e., contains no active pesticides. Finally, on the retail box containing the “Eradicator” it states, “this 25(b) product is exempt from registration with the Federal Environmental Protection Agency under FIFRA regulations.” The averments by the Plaintiff within this paragraph are knowingly false – Spartan knows that its “Eradicator” product is not “regulated” by the EPA – Spartan specifically applied for a federal registration to be exempt from FIFRA under 40 C.F.R. §152.25(f)(1). Moreover, Spartan’s averment, that its “Eradicator” product contains a pesticide, is knowingly false – the “Eradicator” contains no true active ingredient pesticide as defined by the EPA etc., and within its own registration and documentation supplied to the Commonwealth’s Department of Agriculture, contains no pesticides. Spartan’s own filing and the list of inert ingredients at Table 2 – Inert Ingredients (reproduced above), shows unequivocally that there is no active

ingredient within the “Eradicator.” Thus, the statements by the Defendant are true, i.e., the “Eradicator” is not regulated and contains no pesticides. This information is publicly available upon the PA Department of Agriculture website and is submitted to it by Spartan – the best evidence that the claims regarding the “Eradicator” by the Defendant were true. It is axiomatic that *registration* under the EPA regulations does not mean that the EPA *regulates*, in any sense of the word, the product under FIFRA. Finally, the Plaintiff no longer sells the “Eradicator” but instead has withdrawn it from the market and replaced it with a “Pro Tech Eradicator” bait trap, now containing boric acid – which is a pesticide regulated by the EPA.

21. Admitted to the extent that the Defendant opined about the success of the sales of the “Eradicator” product, lamenting the fact that consumers rely upon and trust the completely unsubstantiated claims of the Plaintiff that the “Eradicator” eliminates 95% of mosquitoes for up to 90 days. It is denied this constitutes defamation in any way, as the opinion is formed upon the studies the Defendant himself conducted, based upon all available independent scientific literature, and based upon the utter lack of biochemical availability of a small amount of sugar+yeast → CO₂ and salt toxicity for a 90 day period. The utter lack of supporting data in the face of a scientific consensus to the contrary in turn logically questions the honesty and integrity of the executives of the Plaintiff. Throughout the Complaint, the Plaintiff doubles-down on its unethical behavior by repeating its bad faith, false statements regarding the “Eradicator” – i.e., that it is

“regulated by the EPA” and that it “contains a pesticide.” Both averments are false and yet are repeated throughout the Complaint. Plaintiff itself admits, via publicly-available filings with the Commonwealth and the EPA, that the “Eradicator” contains no active ingredient, hence, no pesticide.

22. Denied. This averment constitutes an incorrect conclusion or proposition of law to which no response is required. Further, Defendant formed this opinion upon the discovery of live, active spotted-wing drosophila larva within the “Eradicator” upon which he conducted his live field-testing. The “ideal conditions” wherein the spotted wing drosophila thrive is a provable scientific fact not subject to re-interpretation by the Plaintiff. Thus, this statement is true or otherwise an opinion based upon actual testing of the “Eradicator” product. In essence, Defendant logically deduces that if the product does not reduce mosquitoes but is actively attracting different invasive insects which then are able to breed within the inactive brew inside the “Eradicator,” then deploying the “Eradicators” draws the invasive insect to the area without eliminating it – thus contributing to the potential spread of the invasive species – thus, is true upon the good faith information and belief of the Defendant.

23. Denied as stated. This averment constitutes an incorrect conclusion or proposition of law to which no response is required. Further, this averment is demonstrably false – Spartan has been engaged in a public relations campaign since at least May of 2017 to explicitly convince the public that its “Eradicator” product was effective at reducing mosquitoes that carry Zika and/or other

mosquito-borne illnesses. Indeed, in or around May 12, of 2017, Jeremy Hirsch, President of Spartan, began his public relation campaign to convince the public that the “Eradicator” was, **“the most successful response to Zika anywhere in the world on record,”** based upon its deployment at a “Zika site” within Lamar County, Mississippi. He further stated, “anyone can use this from municipalities to governments to parks to homes, and residential is really what we care about most...it was founded to keep my family safe. The point of this is to keep everybody’s family safe.”¹⁸

Thus, the Defendant’s statement that the “Eradicator” puts people’s health at risk is true, based upon the lack of efficacy of the product and the false claims of Zika prevention, etc., of Spartan. No facts, evidence, studies, internal data, or the like is supplied by the Plaintiff to show that the “Eradicator” eliminates 95% of mosquitoes for up to 90 days, or has any effect whatsoever to reduce the carriers of mosquito-borne illnesses. **A discerning individual would question why Spartan is unable to supply, commission, or even point to a publicly available independent study that supports any of the claims of the “Eradicator” product.** Moreover, if the “Eradicator” was tested all over the world, as stated by Jeremy Hirsch, then those tests should be readily available – yet, not only are they not available, they are specifically prevented from release by Spartan via a Non-Disclosure Agreement with its testers. If the “Eradicator” reduced the mosquito population by 95% for 90 days as claimed, then it should be relatively simple to

¹⁸ Hattiesburg Man Invents Product to Control Mosquitoes. WDAM. May 12, 2017.

commission a study to show at least *some* impact upon the mosquito population - yet, all available independent scientific data and evidence shows that the “Eradicator,” and sugar/yeast/salt traps themselves, are completely ineffective at reducing mosquito populations (in fact, some studies found that the traps actually *increased*¹⁹ the pest population in the area).

Further, it is merely a logical deduction of the Defendant that if a product is touted for 95% mosquito control for up to 90 days, it necessarily contains claims that it reduces the spread of mosquito-borne illnesses. It is also logical to deduce that, if the product contains no active ingredient and lists no pesticides upon its registration, is unregulated by the EPA, and field-testing as well as all available independent studies show no efficacy of the “Eradicator,” then it cannot eliminate 95% of mosquitoes, and therefore cannot reduce the spread of mosquito-borne illnesses. Finally, the logical summation is that if customers purchase the product relying upon the false advertisement that the “Eradicator” can eliminate 95% of mosquitoes for up to 90 days, then they would not purchase or otherwise engage in further mitigation efforts - exposing them to a higher risk of contracting a mosquito-borne illness because they reasonably believe that the “Eradicator” is wiping out 95% of mosquitoes in the area. Each and every one of these deductions by the Defendant arise out of the plain statements of Spartan regarding the “Eradicator,” the Defendant’s exhaustive testing of the “Eradicator,” his doctorate

19 Daxiang Yang Carnivory in the larvae of *Drosophila melanogaster* and other *Drosophila* species, Scientific Reports (2018) 8:15484, doi.org/10.1038/s41598-018-33906-w

in biology, his correspondences with non-profits and scientists, independent scientific studies, and the biochemical laws of physics and biology.

24. Denied. This averment is demonstrably false and constitutes bad faith pleadings to this Court. The knowingly false nature of this averment, i.e., “Plaintiff does not make health claims about the Spartan Mosquito Eradicator,” and numerous other knowingly false averments within the instant Complaint, demonstrates the lack of candor to this Court and constitute a clear malicious intent to use a federal proceeding to silence or chill the speech of legitimate scientific inquiries on its “Eradicator.” Indeed, since at least May of 2017, Jeremy Hirsch, President of Spartan, has engaged in a public relations campaign to convince potential customers that his “Eradicator” product was, **“the most successful response to Zika anywhere in the world on record... it was founded to keep my family safe. The point of this is to keep everybody’s family safe.”** Within the “Eradicator” distributed literature, Spartan again claimed that, “fewer bites equal fewer opportunities for mosquito-vectored illnesses.” If fewer bites lead to less chance of mosquito-vectored illnesses, then by the own logic of the Plaintiff, the failure to reduce bites combined with the belief that the consumer is protected, can only increase (if any) the chances of acquiring a mosquito-vectored illness. As recently as 2019, Spartan touted on its website that the “Eradicator” will “Protect your family.”²⁰ In 2020, Spartan attempted to enter into a partnership with the Republic of Togo, to eradicate the rampant Malaria-vector mosquitoes

²⁰ Wayback archive of Spartan website, 2019.

within Togo.²¹ It is evident that since the founding of Spartan in 2017, Jeremy Hirsch has consistently and explicitly positioned Spartan (and the “Eradicator”) as a boon to public health and a product that can prevent or dramatically reduce mosquito-borne illnesses. It is a violation of EPA Condition 4 for a product claiming to control or mitigate insects...carrying specific diseases.” See EPA 25(b) Condition 4.²²

25. Admitted only to the extent that the Defendant has made dozens of truthful statements regarding the lack of efficacy of the “Eradicator” and that Spartan deceived low-income customers by knowingly promoting the “Eradicator” as a cheap, effective alternative to mosquito control, which it knows or has reason to know is ineffective. Spartan touted its “Eradicator” as a “cheap, 25\$ alternative” to the expensive spraying (which is indisputably effective for mosquito control), thereby attempting to prey upon the low-income, low-information consumer.

26. Denied. This averment constitutes an incorrect conclusion or proposition of law to which no response is required. Further, Plaintiff cannot identify a single truly “false” statement made by the Defendant with knowledge of its falsity or reckless disregard. Baldly concluding that the Defendant acted with knowledge or reckless disregard is well below the requisite standard required for a Federal action – the Plaintiff must show some evidence or testimony, or malice on

21 Atcha-oubou, T., MD-MPH. Togo's National Program for Fight Against Malaria (PNLP) to Launch Mosquito Eradication Initiative in West Africa, January 16, 2020
https://www.wfmz.com/news/pr_newswire/pr_newswire_health/togos-national-program-for-fight-againstmalaria-pnlp-to-launch-mosquito-eradication-initiative-in-west/article_53212b60-8624-562b-a944-c55bfeb2c89.html

22 <https://www.epa.gov/minimum-risk-pesticides/conditions-minimum-risk-pesticides>

behalf of the Defendant - which it cannot. Moreover, false and misleading statements on a label are a breach of EPA conditions. See 40 CFR 156.10(a)(5)(i) – (viii). The CDC, for example, specifies that source reduction is the meaningful method of mosquito-vector-borne illness control, and that trap devices only for monitoring, stating:

“source reduction is the elimination or removal of habitats that produce mosquitoes. This can range from draining and scrubbing water holding containers on a weekly basis to properly disposing of discarded tires, rain barrels, and trash containers that may harbor rain water. This can be difficult to accomplish with the Zika virus vector *Ae. aegypti*, which readily uses very small water containers.”²³

The “Eradicator” is nothing more than a small water container.

27. Denied. Spartan has suffered no damages and can identify none, as this claim is completely unsupported by any fact, law, or sworn testimony. Not one document has been placed into the record showing any losses related in any way to the Defendant’s statements. Spartan does not appear to even manufacture the “Eradicator,” but instead only sells the “Pro-Tech” new version, which **now** contains an active pesticide. The Plaintiff apparently voluntarily pulled the “Eradicator” after more than a dozen states and territories banned it, including this Commonwealth (presumably because there was no scientific basis for the unscientific claims made by Spartan regarding the “Eradicator” when the PA Dept. of Agriculture inquired as to same). It is believed and averred that the Plaintiff cannot show any harm or damages of any kind attributable to the “Eradicator,” due

²³ CDC Public Health – Vector Control, Mosquitoes: <https://www.cdc.gov/zika/public-health-partners/vector-control-us.html>

to its steadfast refusal to provide any evidence or testimony regarding monetary losses or other damages. As such, the amount in controversy cannot exceed \$75,000.00, and therefore this Court lacks subject matter jurisdiction for the Plaintiffs' claims.

COUNT I
DEFAMATION

28. This paragraph constitutes incorrect conclusions or propositions of law and requires no response. The preceding paragraphs are incorporated within the responses herein.
29. Denied. This averment constitutes knowingly false statements issued by the Plaintiff as well as incorrect conclusions or propositions of law to which no response is required. Further, the Plaintiff mis-characterize the statements of the Defendant as “accusations” and conflates publicly-available true facts and the opinions of the Defendant derived therefrom, as untruthful statements. Indeed, the claim of “misleading state agencies” via public comments and petitions, is not an actionable count under the laws of the Commonwealth of Pennsylvania or Federal law, and also is protected communication under the Constitution of this Commonwealth as well as the First Amendment to the Federal Constitution, which specifically protects even untrue communications, petitions, and correspondences with state agencies. See, e.g., 27 Pa. C.S. § 8301, *et. seq.* (...a person “that makes an oral or written communication to a government agency relating to enforcement or implementation of an environmental law or regulation shall be immune from

civil liability...where the action or communication is aimed at procuring favorable governmental action...” unless the allegation in the action is “not relevant or material” and “is knowingly false, deliberately misleading, or made with malicious and reckless disregard for the truth or falsity.”) The statement regarding “scamming customers” and “deceptive advertising” is identical to the allegations made within the Class Action Lawsuit²⁴ currently pending against AC2T, Inc., specifically regarding the fraudulent/false advertising, deceptive business practices, product liability claims, and breach of warranties of the “Eradicator” and AC2T, and additionally, constitutes wholly protected opinion of the Defendant. Plaintiff has failed to meet its burden of proof that these statements are false; let alone defamatory. Indeed, the statements themselves are not false, or are reasonably considered speculations, opinions, and/or are direct contradictory responses to public, unsupported claims of Spartan.

30. Denied. This averment constitutes an incorrect conclusion or proposition of law to which no response is required. Further, Plaintiff intentionally mis-characterizes the statements of the Defendant, and utterly fails to plead facts or relevant statements – Spartan cannot even identify which statements are “defamation per se” with the requisite specificity; rather, it baldly asserts that “many of the statements are defamatory per se.”

31. Denied. This averment constitutes an incorrect conclusion or proposition of law to which no response is required. Further, the Defendant has

²⁴ Consolazio, et al v. AC2T, INC, Bonner Analytical Testing Co., and Jeremy Hirsch, 1:20-cv-03477, S.D. N.Y. 2020.

not issued any defamatory statements regarding the “Eradicator” or regarding AC2T, Inc. to any recipient. All statements made by the Defendant regarding the “Eradicator” or AC2T, Inc. were true, reasonably true based upon the Defendant's knowledge, protected speech, immune, or otherwise reasonably-formed opinions.

32. Denied. This averment constitutes an incorrect conclusion or proposition of law to which no response is required. Further, Defendant has not issued any defamatory statements. All statements made by the Defendant regarding the “Eradicator” or AC2T, Inc. were true, reasonably true based upon the Defendant's knowledge, protected speech, immune, or otherwise reasonably-formed opinions.

33. Denied. Spartan cannot identify a single “economic damage” attributable to the Defendant and has not pled a single monetary harm to its business. Moreover, Spartan is not authorized to distribute the “Mosquito Eradicator” within the Commonwealth of Pennsylvania, as it withdrew its 2020 registration with the Pennsylvania Department of Agriculture after the Department requested efficacy data. Shortly before or after the filing of the Complaint, the “Eradicator” was deemed illegal to sell or ship to this Commonwealth pursuant to the Pa. Pesticide Control Act, in addition to being banned in a dozen other states. Further, upon information and belief, Spartan no longer manufactures or sells the “Eradicator,” and cannot identify any harm or damages resulting from any statements from the Defendant and is not entitled to relief. See, e.g., Williams v. Best Buy Co., 269 F.3d 1316, 1321 (11th Cir. 2001).

Thus, Spartan withdrew the product from the market, presumably because they could not supply proper efficacy data to the state regulatory agencies, and presumably because a Class Action Lawsuit for fraud/false advertising was filed against Spartan at the end of 2019 regarding the “Eradicator.” Spartan cannot now claim that Defendant is somehow responsible for its own removal from circulation (at least within this Commonwealth) nor can the Defendant be responsible for a class action lawsuit against it, or a state agency refusing to issue a certification for its “Eradicator.” Plaintiff cannot seek damages from the date of the state-ordered removal of the “Eradicator” from the market – as a result, the Plaintiff cannot identify any harm (or damages) to its business resulting from statements of the Defendant, and is seeking to scapegoat the Defendant for its fraudulent business model and attempting to silence public scientific criticism of its flawed “Eradicator.”

COUNT II
COMMERCIAL DISPARAGEMENT

34. This paragraph constitutes incorrect conclusions or propositions of law and requires no response. The preceding responses are incorporated within the responses herein.
35. Denied. Plaintiff intentionally mis-characterizes the statements by the Defendant by flat out altering the statements, removing contextual references, and alternatively cherry-picking or improperly summarizing the responses. Further, Defendant's statements are true, reasonably true based upon his information, are

responsive to falsities promoted publicly by Spartan, contain opinions, and are constitutionally-protected or immune speech. Unfair characterizations or “innuendos” of the Defendant's statements do not render them defamatory. Livingston v. Murray, 417 Pa. Super. 202, 215 (Pa. Super. Ct. 1992).

36. Denied. This averment constitutes an incorrect conclusion or proposition of law to which no response is required. Further, in 2017, Jeremy Hirsch, Spartan CEO, began claiming within press releases that the “Eradicator” was, **“the most successful response to Zika anywhere in the world on record.”** Hirsch further stated,

“anyone can use this from municipalities to governments to parks to homes, and **residential is really what we care about most...it was founded to keep my family safe. The point of this is to keep everybody’s family safe.**”

Defendant's statement was in direct response to the Plaintiff making outlandish and indefensible public statements regarding the Zika (and other) health benefits of the “Eradicator,” and as a result of the refusal of the Plaintiff to supply to Defendant any basis or studies which would verify the efficacy of the “Eradicator.” [See Exhibit “C” of the Complaint]

If the “Eradicator” was truly the “most successful response to Zika anywhere in the world on record,” then the company likely would not be facing a Class Action lawsuit for fraud/false advertising regarding the claims of the “Eradicator,” would not have withdrawn it for sale globally and no longer sell the “Eradicator,” and it likely would not have been banned by a dozen or more states.

Clearly, the Plaintiff, and its executives, have lied repeatedly to the public – Plaintiff has impugned its own honesty and integrity without any statements by the Defendant. Further, Plaintiff claims his “Exhibit C” shows the Defendant issuing a defamatory statement that Spartan was in violation of federal law - federal law is public record, and an interpretation of the Defendant that the Plaintiff's wild claims regarding the health benefits of the “Eradicator” violate FIFRA Regulations is unequivocally a true statement (as well as an opinion) under the plain, black-letter reading of the Federal Insecticide, Fungicide, & Rodenticide Act and FIFRA 25(b) exemption, as well as EPA Regulations, etc.

37. Denied. Defendant's statements were true, reasonably true, protected speech, based upon his own observations and testing, and/or opinions which are not defamatory. Defendant issued the statements primarily to state, federal, and/or regulatory agencies, or to the public to petition for support, or in response to the public claims of the Plaintiff, and were never issued to cause financial loss. Any financial losses are the sole and direct result of the Plaintiff issuing fraudulent/false advertising claims, the utter lack of any published independent study supporting said claims, the scientific consensus that toxic salt/yeast bait traps are completely ineffective, and the removal of the “Eradicator” from the market by Spartan.

WHEREFORE, Defendant Colin Purrington demands judgment in his favor against Plaintiff AC2T, Inc., d/b/a Spartan, and awarding all costs and expenses,

including attorneys fees and the like, and that the Complaint be dismissed with prejudice.

NEW MATTER

38. The Defendant, Colin Purrington, incorporates all responses above herein as though the same were set forth at length.
39. This Court lacks subject matter jurisdiction as the case in controversy of the Plaintiff does not exceed \$75,000.00, exclusive of attorneys fees or costs, pursuant to 28 U.S.C. §1332.
40. Spartan's president, Jeremy Hirsch, invented the "Eradicator," a so-called toxic salt/yeast bait trap. He has no formal education in biology, anatomy, virology, microbiology, or entomology.
41. Spartan has publicly stated that the "Eradicator" was tested all over the world, and everywhere it tested, it "worked phenomenal."
42. Spartan has publicly stated that the "Eradicator" was the most successful response to Zika anywhere in the world.
43. Spartan has publicly stated the "Eradicator" was better than sprays, repellents, candles, and repellent services at controlling mosquitoes.
44. Spartan has publicly marketed the "Eradicator" to families as a cheap, effective means of health protection from mosquito-vectorred illnesses.
45. Spartan has publicly made health-related claims regarding the "Eradicator."
46. Spartan has never commissioned an independent laboratory to verify the efficacy of the "Eradicator."

47. Spartan has prevented the release of all tests regarding the “Eradicator” it has undertaken.
48. Spartan stated on its packaging purchased by the Defendant that “the mosquito population... will be 95% controlled for up to 90 days.”
49. Spartan stated that the “Eradicator” eliminated 95% of mosquitoes.
50. Similarly, it stated there are only three ingredients in the “Eradicator” - 88.34% Sugars, 11.48% Salt, and .18% Yeast.
51. Spartan stated on its packaging the “Eradicator” “create[s] a barrier, giving the mosquitoes a target that emits the same attraction triggers as people and animals.”
52. Spartan has stated that the salt water concoction is consumed by the mosquitoes after being drawn by the Carbon Dioxide given off by the yeast processing the available sugars, causing the mosquitoes to die.
53. There are no independent or peer-reviewed studies which support the claim that the “Eradicator” controls mosquito population for 95% for up to 90 days.
54. There are no independent or peer-reviewed studies which support the claim that the “Eradicator” creates a barrier to protect the consumer.
55. There are no independent or peer-reviewed studies which support the claim that salt ingestion by mosquitoes causes their death.
56. There is no scientific basis for the claim that sodium chloride ingestion reduces or eliminates mosquitoes.

57. Leading entomologists in the state of citizenship of Spartan, Mississippi, have determined that there is no scientific basis for the claims of Spartan regarding the “Eradicator.”
58. There is a scientific consensus regarding the lack of efficacy of toxic salt/yeast bait traps.
59. Salt water (sodium chloride + tap water) is designated an inactive ingredient by the EPA, and is not a pesticide.
60. Yeast is designated an inactive ingredient by the EPA, and is not a pesticide.
61. Sugars are designated an inactive ingredient by the EPA, and are not pesticides.
62. Carbon Dioxide is designated as an inactive ingredient by the EPA, and is not a pesticide.
63. There are no independent or peer-reviewed studies which show that yeast consumption or exposure in these minor amounts causes mosquito death.
64. The “Eradicator” cannot produce CO₂ for more than 48 hours.
65. Spartan, via its president Jeremy Hirsch, has admitted to state or federal regulators that the “Eradicator” cannot produce CO₂ for more than a few days.
66. The “Eradicator” attracts other types of insects and pests.
67. Spartan, via its president Jeremy Hirsch, has admitted to state or federal regulators that the “Eradicator” marketing was misleading.

68. Spartan has violated federal regulations regarding its claims and marketing of the “Eradicator.”
69. Spartan has violated the conditions of the EPA 25(b) exemption regarding the “Eradicator.”
70. The “Eradicator” was not regulated by the EPA.
71. The “Eradicator” was not government regulated.
72. The “Eradicator” does not prevent, destroy, repel, or mitigate mosquitoes.
73. The “Eradicator” contains no pesticide as defined by 7 U.S. Section 136(a).
74. Defendant documented his test of the “Eradicator” and published the detailed results.
75. All of the Defendant's statements were directed at state, federal, or non-profit environmental or regulatory agencies, or to the public, in an attempt to petition support for the review of the “Eradicator.”
76. Spartan no longer makes the “Eradicator.”
77. Spartan has withdrawn the “Eradicator” from the market because it could not supply proper efficacy data to the state and/or federal regulatory agencies.
78. The “Eradicator” has no active ingredient as defined by the EPA, Congress, or federal regulations.
79. Spartan listed no active ingredient in its registration for the “Eradicator” within this Commonwealth.
80. Spartan has now replaced the “Eradicator” with a new model, the “Pro Tech” which contains an additional ingredient, boric acid.

81. Boric acid is a pesticide, regulated by the EPA and FIFRA.
82. Spartan cannot seek damages from the date of state-ordered removal of the “Eradicator” from the market., and has no losses. See Exhibit “E” attached hereto.
83. Spartan is seeking to scapegoat the Defendant for its fraudulent advertising and attempting to silence public scientific criticism of its flawed “Eradicator.”
84. Spartan's claims are barred due to the one year Statute of Limitations codified at 42 Pa. C.S. § 5523(1).
85. Plaintiff fails to state a claim upon which relief can be granted.
86. Spartan cannot show that any of the statements identified in the Complaint which are false or malicious, or otherwise not opinions of the Defendant.
87. Spartan was prohibited from selling the “Eradicator” toxic salt/yeast bait trap by numerous state agencies as a result of the communications by the Defendant to regulatory agencies and his public campaigns.
88. Plaintiff is a public figure not entitled to relief.
89. Plaintiff cannot show any independent scientific studies which contradict the statements of the Defendant regarding the lack of efficacy of the “Eradicator.”
90. Spartan is estopped from pursuing its claim as it “invited” these statements, and any potential defamation, by engaging with and responding (or removing) statements of the Defendant.
91. Spartan and its executives publicly “doxxed” the Defendant's wife in retaliation for his statements.

92. Defendant's statements are protected pursuant to the First and Fourteenth Amendments of the U.S. Constitution. See, e.g., New York Times v. Sullivan, 376 U.S. 254, 84 S. Ct. 710 (1964).
93. Defendant's statements are protected under the *Noerr-Pennington* Doctrine.
94. Defendant's statements are protected or immune pursuant to the Constitution of the Commonwealth of Pennsylvania.
95. Defendant is immune from suit pursuant to 27 Pa. C.S.A. § 8302 *et seq.*, as his communications and statements relate to procuring favorable government action on an environmental law or regulation, and more importantly, they were true. None of the statements were knowingly false or made with reckless disregard for the truth or falsity, nor were any statements made with the intent to undermine a business contract or relationship of the Plaintiff(s). See, e.g., Penllyn Greene Associates, LP v. Clouser, 890 A.2d 424, (Pa. Cmwh. 2005).
96. Defendant's statements are protected and are fully justified pursuant to 42 Pa. C.S.A. §8342, as his statements and communications were true or substantially true and specifically to encourage public information and investigation, without malicious intent.
97. Defendant's statements are true independently verifiable facts, or substantially true, which is a complete bar to the action of the Plaintiff. See, e.g., Hatchard v. Westinghouse Broadcasting Co., 516 Pa. 184, 194 (Pa. 1987); ToDay's Hous v. Times Shamrock Communs., Inc., 21 A.3d 1209, 1215 (Pa. Super. Ct. 2011).

98. Defendant's statements constitute reasonable opinion which is not defamatory under Pennsylvania law. See, e.g., Baker v. Lafayette College, 516 Pa. 291, 297 (Pa. 1987).
99. Defendant's statements form part of the claims, facts, and/or basis of the Class Action lawsuit currently pending against Spartan and thus the Defendant is entitled to absolute privilege pursuant to the doctrine of judicial privilege. See e.g., Schanne v. Addis, 2015 Pa. LEXIS 1780, *13 (Pa. Aug. 17, 2015).
100. Defendant's statements and public blog posts were privileged pursuant to the fair report privilege and because they involved the interest of the public. See, e.g., Sciandra v. Lynett, 409 Pa. 595, 600 (Pa. 1963); Moore v. Cobb-Nettleton, 2005 Pa Super 426, P7 (Pa. Super. Ct. 2005).

WHEREFORE, Defendant Colin Purrington demands judgment in his favor against Plaintiff AC2T, Inc., d/b/a Spartan, and awarding all costs and expenses, including attorneys fees, punitive damages, and the like, and that the Complaint be dismissed with prejudice.

COUNTERCLAIM

Abuse of Process

Colin Purrington

v.

AC2T, Inc. d/b/a Spartan

101. Spartan has committed common law abuse of process. Subsequent to the initiation of the Complaint, Spartan has sought to use the discovery process to

inflict maximum financial and reputation harm to Colin Purrington, the counter-claim Plaintiff, including:

- a. failing or refusing to remove knowingly false or misleading statements from amended pleadings, causing needless legal responses;
- b. refusing to provide requested discovery (despite being the initiator of the lawsuit), necessitating the costs and expenses for a Motion to Compel, yet repeatedly is seeking to schedule the deposition of Mr. Purrington, currently seeking a mid-July date certain;
- c. seeking voluminous and time-consuming discovery from Mr. Purrington, much of which was merely a fishing expedition, and yet required attorney review, furthering Spartan's goal of inflicting immediate financial harm; and,
- d. is actively using the survival of their claim from the Motion to Dismiss to intimidate and chill the speech of other individual scientists, organizations, and the like from publishing prior-completed or future studies on the product – including studies which directly refute the public claims of Spartan regarding its “Eradicator.”

See, e.g., Gen. Refractories Co. v. Fireman’s Fund Ins. Co., 337 F.3d 297, 304 (3d Cir. 2003); Lerner v. Lerner, 954 A.2d 1229, 1238 (Pa. Super. Ct. 2008), *quoting Shiner v. Moriarty*, 706 A.2d 1228, 1236 (Pa. Super. Ct. 1998), *appeal denied*, 729 A.2d 1130 (Pa. 1998) (moving party must show that the non-moving party “(1) used a legal process against the [moving party], (2) primarily to accomplish a

purpose for which the process was not designed, and (3) harm has been caused to the [moving party].”)

102. All of these actions subsequent to the filing of the Complaint were intentionally designed to cause needless, excess expense to Mr. Purrington, in an improper attempt to financially punish Mr. Purrington for refusing to settle the Complaint immediately after filing in compliance with its demands that he remove, retract, and apologize for his comments, in addition to paying damages.

103. These damages suffered by Mr. Purrington are real and calculable, and have caused unnecessary hardship and distress on Mr. Purrington and his family.

104. Mr. Purrington has been left with little choice but to borrow from his retirement account, seek funding from the sympathetic public via gofundme campaigns, and the like.

105. Mr. Purrington has documented these hardships and the over-the-top lengths of Spartan to attempt to silence him, publicly on his blog - the Spartan lawsuit is common knowledge in the industry as well as public record.

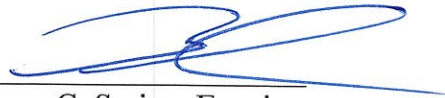
106. Further, the subsequent proceedings in this action are now being weaponized by Spartan to imply financial disaster to any individual or small organization which would consider publicly supporting or publishing evidence in support of Mr. Purrington.

107. Spartan is promoting the survival of its knowingly false statements in its Complaint to undermine or ostracize Mr. Purrington. It is specifically alleged that at least one non-profit organization refused to publish a study and statement

condemning the “Eradiator” once they discovered the substantial financial losses that were accruing by Mr. Purrington.

WHEREFORE, Counterclaim Plaintiff Colin Purrington demands judgment in his favor against counterclaim Defendant AC2T, Inc., d/b/a Spartan for abuse of process, and awarding all damages, costs and expenses, including attorneys fees, punitive damages, and the like.

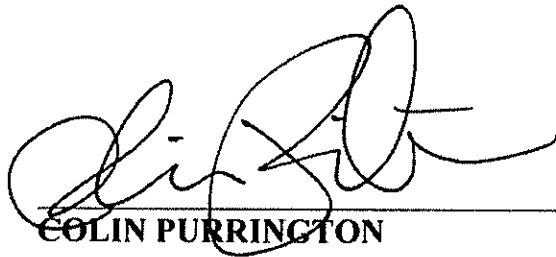
Respectfully submitted,



Trevor C. Serine, Esquire
PA Attorney ID No.: 316805
Serine Law
30 West Third Street
Media, PA 19063
P: 4844486426
TCS@Serinelaw.com

VERIFICATION

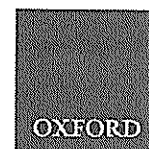
I, COLIN PURRINGTON, verify that the statements issued within the attached ANSWER WITH NEW MATTER AND COUNTERCLAIM are true and correct to the best of my knowledge, information and belief. I understand that false statements issued herein are subject to the penalties of the Pennsylvania Criminal Code at 18 Pa. C. S. §4904, relating to unsworn falsification to authorities.



COLIN PURRINGTON

06/24/2021
Date

EXHIBIT A



No Evidence That Salt Water Ingestion Kills Adult Mosquitoes (Diptera: Culicidae)

Donald A. Yee,^{1,7} Catherine Dean,¹ Cameron Webb,^{2,3,4} Jennifer A. Henke,⁴ Gabriela Perezchica-Harvey,⁴ Gregory S. White,⁵ Ary Faraji,^{5,6} Joshua D. Macaluso,⁶ and Rebecca Christofferson⁶

¹School of Biological, Environmental, and Earth Sciences, University of Southern Mississippi, Hattiesburg, MS 39460, ²Discipline of Medicine, Westmead Clinical School, Sydney Medical School, University of Sydney, New South Wales 2145, Australia,

³Medical Entomology, NSW Health Pathology, Westmead Hospital, Westmead, New South Wales 2145, Australia, ⁴Coachella Valley Mosquito and Vector Control District, Indio, CA 92201, ⁵Salt Lake City Mosquito Abatement District, Salt Lake City, UT 84116, ⁶Pathobiological Sciences, School of Veterinary Medicine, Louisiana State University, Baton Rouge, LA 70803, and

⁷Corresponding author, e-mail: donald.yee@usm.edu

Subject Editor: Lawrence Hribar

Received 8 August 2020; Editorial decision 8 September 2020

Abstract

Various products and insecticides are available that purport to reduce wild populations of adult mosquitoes. Recently, several manufacturers and general public comments on the internet have promoted devices that claim that ingestion of salt will significantly reduce populations of wild mosquitoes to near zero; there are no known scientific efficacy data that support these claims. We tested the survival of nine mosquito species of pest and public health importance across four adult diets: Water Only, Sugar Water Only (8.00%), Salt Water Only (1.03%), and Sugar + Salt Water. Species included the following: *Aedes aegypti* (L.), *Aedes albopictus* (Skuse), *Aedes dorsalis* (Meigen), *Aedes notoscriptus* (Skuse), *Aedes vigilax* (Skuse), *Anopheles quadrimaculatus* (Say), *Culex pipiens* (L.), *Culex quinquefasciatus* (Say), and *Culex tarsalis* (Coquillett). Male and female mosquitoes were placed in cages and allowed to feed on liquid diets under controlled environmental conditions for 1 wk. For seven of the nine species, adult survival was significantly higher in the presence (Sugar Water, Sugar + Salt Water) versus the absence (Water Only, Salt Only) of sugar, with no indication that salt had any effect on survival. *Anopheles quadrimaculatus* showed intermediate survival in Sugar + Salt to either Sugar Only or no sugar diets, whereas *Aedes dorsalis* showed low survival in Salt Only versus other diets. Based on our data and coupled with the fact that mosquitoes have physiological and behavioral adaptations that allow them to avoid or process excess salt (as found in blood meals), we conclude that there is no scientific foundation for salt-based control methods of mosquitoes.

Key words: attractive toxic sugar bait, Culicidae, diet, sodium chloride, sucrose

The pest and public health risks associated with mosquitoes are significant and are often perceived to be greater where individuals are exposed to mosquitoes in and around residential properties (Halasea et al. 2014). As a result, there continues to be demand for commercial products designed for mosquito control around the home. However, the effective control of mosquitoes has had mixed success. The complex biology and ecology of mosquito species presents challenges in finding an effective and sustainable broad ranging control strategy and the realm of mosquito control has remained relatively static over the past few decades (Faraji and Unlu 2016). Although new technologies and approaches have yielded some success (e.g., attractive toxic sugar baits (e.g., Fiorenzano et al. 2017) and insecticide-treated

bed nets (Nahien et al. 2003), there has been no magic bullet to rid humanity of pestiferous mosquitoes. Over the past few years, there has been growing public interest in novel approaches that purport to help reduce mosquito populations for individual homeowners. One such approach relies on the use of common table salt (sodium chloride) added to a sugar bait to kill adult mosquitoes.

There is a clear demand among the public for affordable and effective mosquito control, and many do-it-yourself approaches have proven popular on internet and social media sites (e.g., YouTube and Facebook). Many of the more widely shared approaches include mixing of various household products alleged to have value as a mosquito attractant, repellent, or control agent. Several devices make claims that salt-based

solutions are active killing agents, with some videos describing this approach having millions of views on social media. Within the past few years, several companies have begun to produce devices in the United States that make the claim that salt feeding by adults will reduce mosquito numbers in the wild. These devices include the Spartan Mosquito Eradicator (ACT2 Inc., Hattiesburg, MS), the Mosquito XT (King Marketing, Paragould, AK), the Skeeter Eater (Copia Products, Memphis, TN), Mosquito Dynamite (Vic West Brands, Austin, Texas), and Donaldson Farms – Mosquito Eliminator (Chattanooga, TN). These devices generally contain some combination of dried salt, sugar, and yeast, which is mixed with warm water by the purchaser and then placed outdoors to either attract mosquitoes who then drink the fluid and are claimed to die from the salt, or who are repelled by the action of other additives like various essential oils. There are no data that have tested the effectiveness of salt as a substance to kill mosquitoes.

There are several reasons why salt may be an effective path for mosquito control. First, adult mosquito nutrition is based on the feeding of plant-derived sugars, which also contain a variety of other substances, including proteins, vitamins, amino acids, and salts (reviewed in Peach and Gries 2019). Thus, salts are an essential component of the adult mosquito diet, however one could hypothesize that at high enough concentrations salt could be lethal, although there are little to no data on the effects of such high concentrations on adult survival. A lack of evidence may simply stem from an avoidance by researchers to investigate what is for many a foregone conclusion (i.e., there is no reason to assume that mosquito adults actively drink salt water in nature). Second, eggs of some species often fail to hatch in water with salt concentrations > 1.0% (e.g., Macfie 1922, Wigglesworth 1933) although *Aedes aegypti* (L.) and *Aedes albopictus* (Skuse) show egg hatchings even at 2.0% salt concentrations (sea water is ~3.5% salt; Yee et al. 2013). Third, although salt can be lethal to larvae of nonsalt adapted species (e.g., Yee et al. 2013), larvae of some mosquitoes, such as *Aedes sollicitans* (Walker) and *Aedes taeniorhynchus* (Wiedemann), are known to have a tolerance to salt (Albers and Bradley 2011). Finally, adult females may avoid laying eggs in water with high salt concentrations (e.g., Woodhill 1941, Foley and Bryan 1999). This avoidance to certain salt concentrations is perhaps a way for females to avoid any lethal effects on their offspring. However, despite evidence to suggest that females may be able to detect high concentrations of salt and that salt can be detrimental to larvae and eggs, there remain little data that directly tests the effect of salt ingestion on adult survival. Finally, there is also little information available on the likely ingestion of salt by adult mosquitoes, or other substances in natural sources of sugar that may have adverse effects on adult survival.

We tested the effect of salt on survival in nine species of adult mosquitoes, all having some relevance to human disease and quality of life. Based on the established knowledge about the physiological responses to salt feeding (e.g., Salama 1966, Shepley and Bradley 1982, Ignell et al. 2010), we hypothesized that low concentrations of salt would not affect adult survival, and we predicted that the addition of salt to a standard sugar diet would not prove to be an effective control mechanism for adult mosquitoes. Given the rise of manufactured products that claim to control mosquitoes via salt feeding, we replicated a set of standard methods across five different research laboratories to test the different species or species complexes of medically important and pestiferous species likely to be encountered by residents around the world.

Materials and Methods

This study represents the combined contributions of five laboratories who tested species available in their area, and although

the methods for the experiments were fundamentally the same, there were slight differences that we highlight by laboratory location (i.e., Australia = AU, USA laboratories are California = CA, Louisiana = LA, Mississippi = MS, and Utah = UT). The nine species included the following: *Aedes aegypti* (L.) (AU, LA), *Ae. albopictus* (Skuse) (MS), *Ae. notoscriptus* (Skuse) (AU), *Ae. dorsalis* (Meigen) (UT), *Ae. vigilax* (Skuse) (AU), *Anopheles quadrimaculatus* (Say) (MS), *Culex pipiens* (L.) (UT), *Cx. quinquefasciatus* (Say) (CA), and *Cx. tarsalis* (Coquillett) (CA). All species are important known vectors of pathogens or nuisance-biting pest species and often are a main focus of vector control and suppression.

Mosquito Colonies

Adult mosquitoes used in all experiments (except *Aedes dorsalis*) were from colonies maintained in each laboratory using similar rearing and husbandry protocols (Table 1). Unless otherwise noted, the environmental conditions for larvae were the same for all feeding trials (detailed below). *Aedes aegypti* (LA) were reared under 28°C. *Aedes dorsalis* were wild caught females that were trapped in field cages using CO₂ as bait and supplied overnight with water but no sugar until the next day when trials began. *Aedes vigilax* were reared in diluted seawater with deionized water to a salinity of ~16 ppK. *Anopheles quadrimaculatus* were purchased as eggs from Benzon Research, Inc. (Cumberland County, PA).

Feeding Trials

All locations used similar environmental conditions for larval rearing and feeding trials (unless noted), with feeding trials conducted either in walk-in or separate smaller environmental chambers kept at 27°C (28°C in the case of LA) on a 12:12 light:dark cycle (UT and MS used a 1 h transition from light to dark and dark to light to reflect natural conditions). Humidity was maintained between 50 and 75%. Cages were approximately 30 × 30 × 30 cm and were of either a metal or plastic frame with mesh covering all sides, with the exception of LA who used one quart paper cylindrical containers (Stanpac, Inc. Ontario, Canada). Into each cage, we added 20 adult mosquitoes (10 males and 10 females) each 1–7 d old. Based on the availability of adults, UT used 17–23 total adults for trials, although an approximately equal sex ratio was still maintained and for *Ae. dorsalis* only females were used. In the time between eclosion and the start of the trials (≤1 wk), adults were fed on a 10% sucrose solution ad libitum under similar conditions as the feeding trials. Female *Aedes dorsalis* were subjected to feeding trials the day after they were collected from the wild.

For the feeding trials, we used four no-choice diets (i.e., adults in each cage only had access to one of the four diets): Water Only (negative control), Salt Water Only (1.03% sodium chloride in water, hereafter Salt Only), Sugar Water Only (8% sucrose in water, hereafter Sugar Only), and Sugar + Salt Water (1.03% sodium chloride and 8% sucrose in water, hereafter Sugar + Salt). Percentages used were based on the product description from the most widely available commercial product (Spartan Mosquito Eradicator) but are similar to other available products. These percentages reflect those found after filling the container with fluid per the manufacturer's directions and not the percentages of dried product. Mosquitoes are commonly fed a 10% sucrose solution in colonies under laboratory conditions. We replicated each diet three times for each species. Liquid for each diet was added fresh on day 1 of the experiment and replaced on day 4. Diets were added to vials with an exposed cotton wick. The trials ran for 7 d and on each day, we recorded the number of dead mosquitoes of each sex. Within each laboratory, all diets were run concurrently for each species.

Table 1. Details of mosquito species used to test the effect of salt on survival

Species, location	Generation	Origin	Larval diet	Blood source
<i>Aedes aegypti</i> , AU	Unknown (in colony since 1980s)	AU	Ground fish flakes and brewer's yeast	<i>Rattus norvegicus</i> , Western Sydney Local Health District and University of Sydney animal ethics approval number 8001/04–10
<i>Ae. aegypti</i> , LA	Unknown	Rockefeller strain	Ground fish food	Hemotek membrane system with bovine blood
<i>Aedes albopictus</i> , MS	F ₁	Hattiesburg, MS	Puppy chow (Purina, Inc.)	Japanese quail, <i>Coturnix japonica</i> , IACUC #11092207
<i>Aedes dorsalis</i> , UT	Wild caught adults	Salt Lake City, UT	None	None
<i>Aedes notoscriptus</i> , AU	Unknown (in colony since 2020)	Sydney, AU	Equal parts brewer's yeast and fish flakes	<i>Rattus norvegicus</i> under Western Sydney Local Health District and University of Sydney animal ethics approval number 8001/04–10
<i>Aedes vigilax</i> , AU	Unknown (in colony since 1986)	Townsville, AU	Equal parts brewer's yeast and fish flakes	<i>Rattus norvegicus</i> under Western Sydney Local Health District and University of Sydney animal ethics approval number 8001/04–10
<i>Anopheles quadrimaculatus</i> , MS	Unknown (in colony since 2011)	Gainesville, FL	Mixture of yeast and lactalbumin	None
<i>Culex pipiens</i> , UT	Unknown (in colony since 2016)	Salt Lake City, UT	Ground rabbit pellets	Hemotek membrane system with bovine blood
<i>Culex quinquefasciatus</i> , CA	Unknown (in colony since 1950s)	Merced, CA	Fish flakes, liver powder, yeast, and ground alfalfa pellets	Ring-neck doves, <i>Streptopelia capicola</i>
<i>Culex tarsalis</i> , CA	Unknown (in colony since 1950s)	Bakersfield, CA	Fish flakes, liver powder, yeast, and ground alfalfa pellets	Ring-neck doves, <i>Streptopelia capicola</i>

For each species, we list the laboratory location (Australia = AU, United States includes California = CA, Louisiana = LA, Mississippi = MS, and Utah = UT) where the trials were conducted, the generation of the mosquitoes, their origin, the diet for larval rearing, and the blood source for adults when used to produce eggs.

Statistical Analysis

Survival analyses were conducted for each species, separately, using PROC PHREG in SAS (2004). Individuals alive regardless of sex at the end of the experiment yielded censored observations, which are accounted for by the analysis. The overall model considered differences among all diets, but was not capable of determining where specific differences existed. To determine differences between diets (e.g., Salt Only vs Sugar Only), we conducted pair-wise comparisons and adjusted the final *P* value to account for multiple comparisons ($P = 0.05/6$ contrasts = 0.008). We did not analyze sex as a separate factor given that none of the claims made by any of the manufacturers of the devices mentioned above suggest sex-specific results of salt feeding, nor did we expect that males and females would differ in their tolerance to ingestion of salt water.

Results

We found significant effects of diet on survival after 7 d of feeding for all species (Table 2). Based on pair-wise comparisons between diets, we generally found significant differences between two sets of diets: those with sugar (Sugar Only, Sugar + Salt), with 7 d survival ranging from 60 to 90%, and those without sugar (Water Only, Salt Only), with 7 d survival ranging from 0 to 20% (Fig. 1A–D, F, H–J). The two exceptions to this were for *An. quadrimaculatus*, which showed intermediate survival in Salt + Sugar compared to either Sugar Only (highest survival), or to Salt Only or Water Only (lowest survival) (Fig. 1G), and for *Ae. dorsalis* wild females which had the lowest survival in Salt Only

Table 2. Results of survival analysis for mosquito species reared across different diet environments

Species	Location	χ^2 , df	<i>P</i> value
<i>Aedes aegypti</i>	AU	60.27, 3	<0.001
<i>Aedes aegypti</i>	LA	89.91, 3	<0.001
<i>Aedes albopictus</i>	MS	46.74, 3	<0.001
<i>Aedes dorsalis</i>	UT	22.48, 3	<0.001
<i>Aedes notoscriptus</i>	AU	91.06, 3	<0.001
<i>Aedes vigilax</i>	AU	54.11, 3	<0.001
<i>Anopheles quadrimaculatus</i>	MS	59.97, 3	<0.001
<i>Culex pipiens</i>	UT	102.62, 3	<0.001
<i>Culex quinquefasciatus</i>	CA	107.28, 3	<0.001
<i>Culex tarsalis</i>	CA	85.11, 3	<0.001

Laboratories where each species were tested are included (Australia = AU, United States includes California = CA, Louisiana = LA, Mississippi = MS, and Utah = UT).

compared to all other diets (Fig. 1E). However, the addition of salt to sugar never led to any species of mosquito to die at a faster rate compared to sugar alone, with the minor exception of a 1-d difference in the LA *Ae. aegypti* where survival in Salt + Sugar was lower than Sugar Only on day 7 (Fig. 1B). Among the genera, *Aedes* divergence in adult survival in diets with sugar compared to those without sugar often occurred between day 3 and 4 of the experiment (Fig. 1A–D, F), whereas for *Culex*, differences in survival between sugar and no sugar diets were apparent almost from the start of the experiment (Fig. 1H–J).

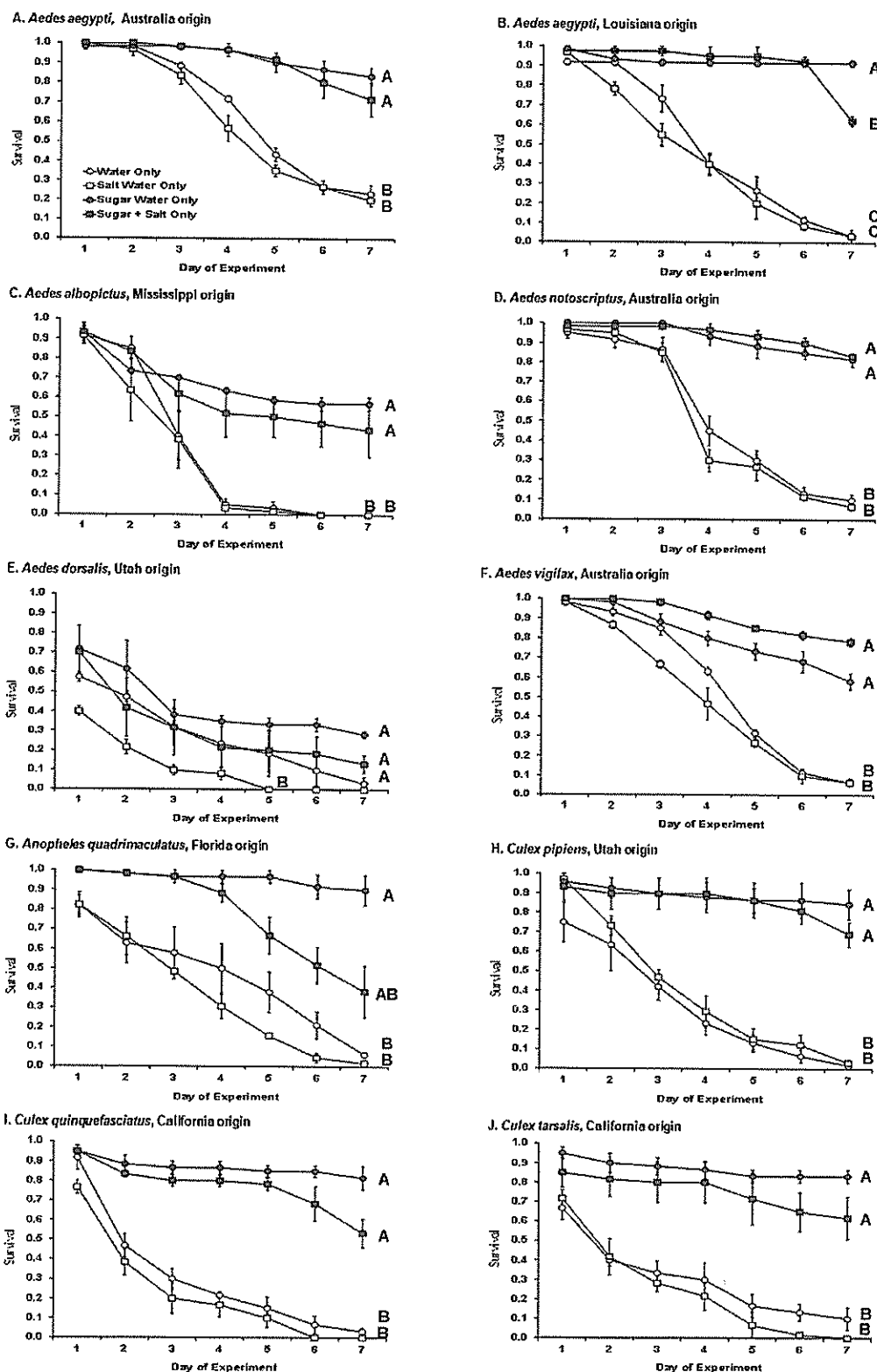


Fig. 1. Survivorship curves (mean \pm 1 SE) across 7 d for mosquito species across different diets (open circle = Water Only, open square = Salt Water Only, gray circle = Sugar Water Only, gray square = Sugar + Salt Water). For each species (A–J), the origin of that population is listed as in Table 1. Curves that share a letter are not significantly different.

Discussion

Our results from testing the effect of salt on the survival of nine mosquito species of public health importance were clear: There was no evidence from these trials that ingestion of salt had an added lethal effect on adult mosquitoes. Thus, our data support the hypothesis that low concentrations of salt would not affect adult mosquito survival. In seven out of nine of our species, we found that mosquitoes that ingested a diet with salt and sugar survived at rates equal to those fed a standard diet of sugar alone. In the cases where this did not occur, the addition of salt caused increased mortality, but in *An. quadrimaculatus*, 40% of adults were still alive at the end of the experiment. For *Aedes aegypti* from the LA colony, the difference in Salt Only and Salt + Sugar diets was only apparent on the last day of the trial. For all but one species, a diet with only saltwater did not lead to higher mortality rates than water alone, and thus this strongly suggests that salt by itself is not a detrimental substance for the mosquito digestive system. *Aedes dorsalis* did show that a salt only diet led to higher mortality compared to all other diets (including Salt + Sugar); however, on the very first day of the experiment, this diet had the lowest overall survival across all species tested, and we note that survival overall was low across all diets (Fig. 1E). Unlike the other species that were reared from larvae in the laboratory, all *Ae. dorsalis* females were wild caught and of unknown age and of unknown sugar feeding status, and thus the higher overall mortality on day 1 could reflect general attrition due to acclimation to laboratory conditions. However, we still did not find evidence that a salt and sugar diet compared to sugar only was detrimental to this species.

It is important to note that mosquitoes often are exposed to salt in nature as part of their normal diet. Adult mosquitoes often ingest salts as a component of plant-derived sugars (reviewed in Peach and Gries 2019) as well as blood (Clements 2000). Human blood is 0.9% salt and is commonly ingested by females of many species of mosquitoes, including those tested here, to complete egg production. However, mosquitoes have physiological mechanisms that allow them to deal with excess salt from blood meals. Specifically, salts like Na⁺, K⁺, and Cl⁻, are first absorbed across the stomach and are then rapidly eliminated by Malpighian tubules with coordinated actions of the hindgut (Bradley 1987). In addition, after an adult female ingests a bloodmeal, they produce copious urine, which is more sodium rich than that produced at other times. This diuresis rids females of 40% of the water, Na⁺, and Cl⁻ in the ingested bloodmeal, and 20% of the ingested weight (Shepley and Bradley 1982). Thus, salt ingestion by adults, perhaps even in levels exceeding those found in human blood, are unlikely to lead to increased mortality given that any detrimental effects are countered with physiological adaptations that adults already possess. We based our salt concentration (1.03%) on product values listed on the most widely available commercial product (Spartan Mosquito Eradicator), and note that this salt concentration is approximately the same that is found in human blood (0.9%). Thus, we can see no way that such a concentration would kill adult mosquitoes given that countless adult female mosquitoes have successfully taken a human bloodmeal and survived to produce prodigious progeny. Indeed, salt water generally had the same effect on adult survival as water alone, providing further evidence that approximately 1% salt is not an effective agent of mosquito mortality.

Besides the ability to deal with excess salt ingested during feeding, female mosquitoes also have been shown to simply avoid high salt fluids. Salt detection itself is crucial for maintaining both the ionic

drive across the gut and maintaining the homeostatic environment of the hemolymph (Salama 1966). Adult mosquitoes can detect salt in water using tarsal segments, which is likely how they evaluate ingesting a nutrient source they touch (Christophers 1960, Salama 1966). Ignell et al. (2010) showed that *Ae. aegypti* rejected diets containing high salt. Specifically, when offered a choice between varying concentrations of sucrose and sucrose and salt, fewer mosquitoes partook of the sucrose with added salt. The response appeared to be bimodal based on salt concentration, with more feeding on sucrose only in concentrations with either higher or lower than 1 mM salt (Ignell et al. 2010). Gonzales and Hansen (2016) demonstrated that sucrose meals including either NaCl or CaCl₂ had higher median rejection thresholds by adults compared to other salts and other chemicals (e.g., HCl). This suggests that mosquitoes, in this case *Ae. aegypti*, reject sucrose solutions that contain high concentrations of salts relative to natural sugar meals. However, there are also data to suggest that salts may be an important stimulatory factor for adult feeding. For *Cx. pipiens*, NaCl at 150 mM acted as a phagostimulant (Hosoi 1959) and meals containing sodium chloride and sodium bicarbonate offered to *Anopheles stephensi* (Liston), *An. freeborni* (Aitken), and *An. dirus* (Petron and Harrison) all elicited greater feeding, indicating that these chemicals were phagostimulatory (Galun et al. 1985); none of these studies reported that higher ingestion of salt led to higher mortality. Even if salt can act to increase feeding, there is no support from our results that it causes increased mortality for the medically important species tested.

In addition to direct feeding on salt, there has been research to investigate how salt may affect other mosquito life history stages and activities, specifically in terms of egg hatching (e.g., Osborn et al. 2006, Yee et al. 2013), larval survival and growth (Wigglesworth 1933, Bañez 1963, Lee 1973, Ramasamy et al. 2011, Albers and Bradley 2011), and oviposition behavior (Woodhill 1941, Wallis 1954, Foley and Bryan 1999, Navarro et al. 2003). Although many species of both saline tolerant and freshwater species have been evaluated, none of these studies appear to suggest that salt is lethal at low concentrations (e.g., <1.00%) to eggs or larvae. Furthermore, where salt has been shown to affect some aspect of life history (eggs, Yee et al. 2013), it also may modify behavior (e.g., oviposition) away from locations with high salt (Woodhill 1941, Navarro et al. 2003).

Although devices currently marketed on social media and by some manufacturers would appear to be, “too good to be true,” consumers have already spent millions of dollars purchasing them, perhaps at the expense of known effective approaches to killing adult mosquitoes. Recent work by Aryaprema et al. (2020) found no evidence that the Spartan Mosquito Eradicator reduces populations of *Aedes albopictus* under controlled laboratory and field conditions. These authors did not test the potential killing action of salt, but focused on the efficacy of the entire product, which also makes other claims (e.g., mosquitoes are attracted CO₂ produced via fermentation by yeast). Our data specifically addressing the effect of salt ingestion appear to support the conclusion of Aryaprema et al. (2020) that the Spartan Mosquito Eradicator in its present formulation does not reduce mosquito populations. In particular, we find no evidence that salt ingestion in adult mosquitoes is an effective control approach.

As in many instances state and federal laws do not require efficacy data to support claims made by these devices, it is important to evaluate individual claims to better inform the public and ensure that limited public health dollars are not needlessly wasted on approaches that do not effectively control mosquitoes (Revay et al. 2013). We would also caution that relying on an approach that has no scientific basis may result in a false sense of security for

homeowners, which may be dangerous in areas where mosquitoes could potentially be transmitting pathogens.

Based on the response of nine medically important species of mosquitoes to different diets, and the substantial literature on the physiological and behavioral ways that mosquitoes deal with salt in nature, we can conclude that there is no scientific or experimental evidence to support the claims that salt-based approaches are effective for mosquito control as currently formulated. As adult mosquitoes do not appear to suffer mortality from ingesting low doses of salt in their diet, and higher concentrations of salt can be detected and avoided by adults, we conclude that salt is ineffective for the control of mosquito populations by individual consumers, regulatory agencies, or mosquito control districts.

Acknowledgments

We thank S. O'Meara for assistance in conducting an extensive literature review on salt feeding and S. A. Juliano for advice about statistical analyses. We also thank N. Reissen, C. Weinrich, G. Anderson, and J. Temme for field and laboratory assistance. Work by R.C. Christofferson was supported by a grant from the National Institutes of Health (R01 GM122077). Two anonymous reviewers provided constructive feedback that improved the final manuscript.

References Cited

- Albers, M. A., and T. J. Bradley. 2011. On the evolution of saline tolerance in the larvae of mosquitoes in the genus *Ochlerotatus*. *Physiol. Biochem. Zool.* 84: 258–267.
- Aryaprema, V. S., E. Zeszutko, C. Cunningham, E. I. M. Khater, and R.-D. Xue. 2020. Efficacy of commercial attractive toxic sugar bait station (ATSB) against *Aedes albopictus*. *J. Fl. Mos. Cont. Assoc.* 67: 80–83.
- Bancz, R. L. 1963. Use of ordinary table salt against breeding of mosquitoes in artificial containers. *Philipp J. Sci.* 92: 447–479.
- Bradley, T. J. 1987. Physiology of osmoregulation in mosquitoes. *Annu. Rev. Entomol.* 32: 439–462.
- Christophers, R. 1960. *Aedes aegypti*. The yellow fever mosquito: its life history, bionomics and structure. Cambridge University Press, London.
- Clements, A. N. 2000. The biology of mosquitoes. CABI Publishing, MA.
- Faraji, A., and I. Unlu. 2016. The eye of the tiger, the thrill of the fight: effective larval and adult control measures against the Asian tiger mosquito, *Aedes albopictus* (Diptera: Culicidae), in North America. *J. Med. Entomol.* 53: 1029–1047.
- Fiorenzano, J. M., P. G. Koehler, R.-D. Xue. 2017. Attractive toxic sugar bait (ATSB) for control of mosquitoes and its impact on non-target organisms: a review. *Int. J. Environ. Res. Public Health* 14: 398.
- Foley, D. H., J. H. Bryan. 1999. Oviposition preference for fresh water in the coastal malaria vector, *Anopheles farauti*. *J. Am. Mos. Cont. Assoc.* 15: 291–294.
- Gonzales, K. K., and I. A. Hansen. 2016. Artificial diets for mosquitoes. *Int. J. Environ. Res. Pu. He.* 13: 1267.
- Galun, R. Koontz, L. Gwadz, R. 1985. Engorgement response of anopheline mosquitoes to blood fractions and artificial solutions. *Physiol. Entomol.* 10: 145–149.
- Halasa, Y. A., D. S. Shepard, D. M. Fonseca, A. Farajollahi, S. Healy, R. Gaugler, K. Bartlett-Healy, D. A. Strickman, G. G. Clark. 2014. Quantifying the impact of mosquitoes on quality of life and enjoyment of yard and porch activities in New Jersey. *PLoS One* 9: e89221.
- Hosoi, T. 1959. Identification of blood components which induce gorging of the mosquito. *J. Insect Physiol.* 3: 191–218.
- Ignell, R., S. Okawa, J. E. Englund, and S. R. Hill. 2010. Assessment of diet choice by the yellow fever mosquito *Aedes aegypti*. *Physiol. Entomol.* 35: 274–286.
- Lee, F. C. 1973. Effect of various sodium chloride concentrations on the development of the mosquito *Culiseta incidens* (Thomson) (Diptera: Culicidae). *Mosq. News* 33: 78–84.
- Macfie, J.W.S. 1922. A note on the action of lithium chloride on mosquito larvae. *Ann. Trop. Med. Parasit.* 17: 9–11.
- Nahlen, B. L. J. P. Clark, D. Alnwick. 2003. Insecticide-treated bednets. *Am. J. Trop. Med. Hyg.* 68 (Suppl 4): 1–2.
- Navarro, D. M. A. F., P. E. S. de Oliveira, R. P. J. Potting, A. C. Brito, S. J. F. Fital, and A. E. Goulart Sant'Ana. 2003. The potential attractant or repellent of different water types on oviposition in *Aedes aegypti* L. (Dipt., Culicidae). *J. Appl. Ent.* 127: 46–50.
- Osborn, F. R., S. Diaz, C. J. Gómez, M. Moreno, and G. Hernández. 2006. Oviposition preference and egg eclosion in different salt concentrations in the coastal malaria *Anopheles aquasalis* Curry. *J. Am. Mos. Cont. Assoc.* 22: 42–46.
- Peach, D. A. H., and G. Gries. 2019. Mosquito phytophagy—sources exploited, ecological function, and evolutionary transition to haematophagy. *Entomol. Exp. Appl.* 168: 120–136.
- Ramasamy, R., S. N. Surendran, P. J. Jude, S. Dharshini, and M. Vinobaba. 2011. Larval development of *Aedes aegypti* and *Aedes albopictus* in peri-urban brackish water and its implications for transmission of arboviral diseases. *PLoS One* 5: 1–10.
- Revay, E. E., A. Junnila, R. D. Xue, D. L. Kline, U. R. Bernier, V. D. Kravchenko, W. A. Qualls, N. Ghattas, and G. C. Müller. 2013. Evaluation of commercial products for personal protection against mosquitoes. *Acta Trop.* 125: 226–230.
- Salama, H. S. 1966. The function of mosquito taste receptors. *J. Insect Physiol.* 12: 1051–1060.
- SAS Institute Inc. 2004. SAS/STAT 9.1 User's Guide. SAS Institute Inc., Cary, NC.
- Shepley, A. W., and T. J. Bradley. 1982. A comparative study of magnesium sulfate tolerance in saline-water mosquito larvae. *J. Insect. Physiol.* 28: 641–646.
- Wallis, R. C. 1954. The effect of population density and of NaCl concentrations in test series in laboratory experiments with ovipositing *Aedes aegypti*. *Mosq. News* 14: 200–204.
- Wigglesworth, V. B. 1933. The adaptation of mosquito larvae to salt water. *J. Exp. Biol.* 10:27–37.
- Woodhill, A. R. 1941. The oviposition responses of three species of mosquitoes (*Aedes* (Stegomyia) *aegypti* Linnaeus, *Culex* (Culex) *fatigans* Wiedemann, *Aedes* (Pseudoskusea) *concolor* (Taylor), in relation to the salinity of the water. *Proc. Lin. Soc. New South Wales*. 66: 287–292.
- Yee D. A., E. Himmel, M. H. Reiskind, and S. M. Vamasi. 2013. Implications of salinity concentrations for the performance and competitive interactions of the mosquitoes *Aedes aegypti* and *Aedes albopictus* (Diptera: Culicidae). *Med. Vet. Entomol.* 28: 60–69.

EXHIBIT B

EFFICACY OF COMMERCIAL ATTRACTIVE TOXIC SUGAR BAIT STATION (ATSB) AGAINST *Aedes albopictus*

VINDHYA S. ARYAPREMA, EDWARD ZESZUTKO,
COURTNEY CUNNINGHAM, EMAD I. M. KHATER AND RUI-DE XUE
Anastasia Mosquito Control District, 120 EOC Drive,
St. Augustine, FL, USA

Guest Editor: Gunter C. Muller

ABSTRACT

The use of toxic sugar baits is a new paradigm in mosquito control. A commercial product of attractive toxic sugar bait station (Spartan Mosquito Eradicator) contains a toxic sugar bait with sodium chloride as the active ingredient and yeast as an attractant. We studied the efficacy of the device against adult *Aedes albopictus* Skuse. The study composed of a laboratory and a field component with treatment and control cohorts. The treatment in the laboratory experiment resulted in nonsignificant mortality of adult mosquitoes compared with untreated mosquitoes. Neither laboratory nor field components of the study showed significant evidence that the commercial product could reduce the abundance of *Ae. albopictus* in the natural environment. The device may need to be improved and further evaluation conducted.

Key Words: attractive toxic sugar bait, *Aedes albopictus*, sodium chloride, efficacy

The use of toxic sugar baits (TSB) targeting sugar feeding behavior of the mosquito is an expanding technology in the field of mosquito control (Fiorenzano et al. 2017). Lea, in 1965 pioneered the method with malathion in a sucrose solution formulating the first mosquito toxic sugar bait (TSB) which was fed to *Aedes aegypti* (Lea 1965). Since then, different toxic substances including boric acid (Blore et al 2018, Qualls et al. 2015, Xue et al. 2006, Xue & Barnard 2003), eugenol (Qualls et al 2014), chlorfenapyr and tolfenpyrad (Stewart et al. 2013) and ivermectin (Maia et al. 2018) have been evaluated against a number of adult mosquito vectors. Adult mosquitoes have easy access to sugar sources, like floral and extra floral nectaries, rotted fruits and damaged fruits in the environment (Bidleingmayer 1973, Foster 1995). Toxic sugar baits have thus been supplemented with suitable attractants that attract adult mosquitoes for the bait in spite of the availability of natural sugars (Qualls et al. 2014). Since the control of mosquito populations with traditional insecticides are becoming less effective due to the development of resistance (Deming et al. 2016), the ATSBs may

be an important alternative option. New ATSB products are therefore, considered to be introduced to the market.

Spartan Mosquito Eradicator is a device with an ATSB released to the market targeting control of adult mosquito populations. The commercial device is a plastic tube (5 cm D x 27 cm H) containing a product of 11.48% sodium chloride (active ingredient-the toxic substance), 0.18% yeast (the attractant) and 88.34% sucrose as a dry powder indicated on the label. The tube lid has 6 small holes of ~3 mm diameter through which the mosquitoes are supposed to go in and feed on the dissolved product. It is designed to hang on trees or structures in the environment. The purpose of this study was to evaluate the effectiveness of the commercial product in reducing population densities of *Aedes albopictus* (Skuse, 1894), an important vector of arboviral diseases, such as dengue, Zika and Chikungunya (Kumari et al. 2011, McKenzie et al. 2019, Monteiro et al. 2019, Paupy et al. 2012, Sivan et al. 2016) that is geographically well distributed over the globe (Kraemer et al. 2015, Paupy et al. 2009).

The study was carried out from October to December 2019 in the laboratory and

field. The commercial products were purchased from online and shipped to AMCD by BioOpus LLC for evaluation. The laboratory study was carried out in three mosquito bug-dorms (BugDorm-2120 insect rearing tent, MegaView Science Co., Ltd. Taiwan) each containing 5-7 day old, 100 female and 100 male *Ae. albopictus* obtained from the insectary of the Anastasia Mosquito Control District (AMCD). One bug-dorm was provided with a Spartan Mosquito Eradicator tube with the original product dissolved in water (treatment bug-dorm) as per the manufacturer's guidelines to make a solution of 450 ml. Once dissolved the actual proportion of active ingredient in the solution was 1% and the proportion of sucrose was 8%. The control bug-dorm was thus provided with a Spartan Mosquito Eradicator tube containing only 8% sucrose solution and the other bug-dorm was provided with two Spartan Mosquito Eradicator tubes, one with the dissolved product and the other with 8% sucrose solution to give the mosquitoes a choice (choice bug-dorm). Number of dead mosquitos in each bug-dorm (in both the tube and the dorm) was counted at 24h intervals for 72 hours. Temperature and relative humidity (RH) of the three laboratory replicates ranged from 18.2 °C -24.6 °C and RH: 56.1%–63.9% respectively.

The field study was carried out at two locations with large tire piles which are known to have high abundance of *Ae. albopictus*. One location was used as the control site and the other as the treatment site rotating bi-weekly to minimize any bias characterized to the location. Five tubes were placed at each site, the distance between each tube was 4 meters; the tubes at the control site had the 8% sucrose solution only and the tubes at the treatment site had the dissolved Spartan product. Weekly mortality counts in each tube were recorded. One BG Sentinel trap (without CO₂) was set out weekly at each site for 24 hours and collected mosquitoes were identified and counted. The study was carried out for 8 weeks.

Notable control mortalities, mainly in males, were observed for all laboratory replicates in spite of all possible remedial measures (Figure 1). Most of the dead mosquitoes were found in the bug-dorm and comparatively very few inside the tubes. It indicates that the mosquitoes were dying due to deprivation of water/sugar (desiccating) as they were not able to enter the devices through the very small holes. Comparatively low female mortality (Figure 1) was likely due to the generally higher survival fitness of females. Mortalities in both males and females were lower in choice bug-dorms than in control bug-dorms (Figure 1). Each preferential bug-dorm having two

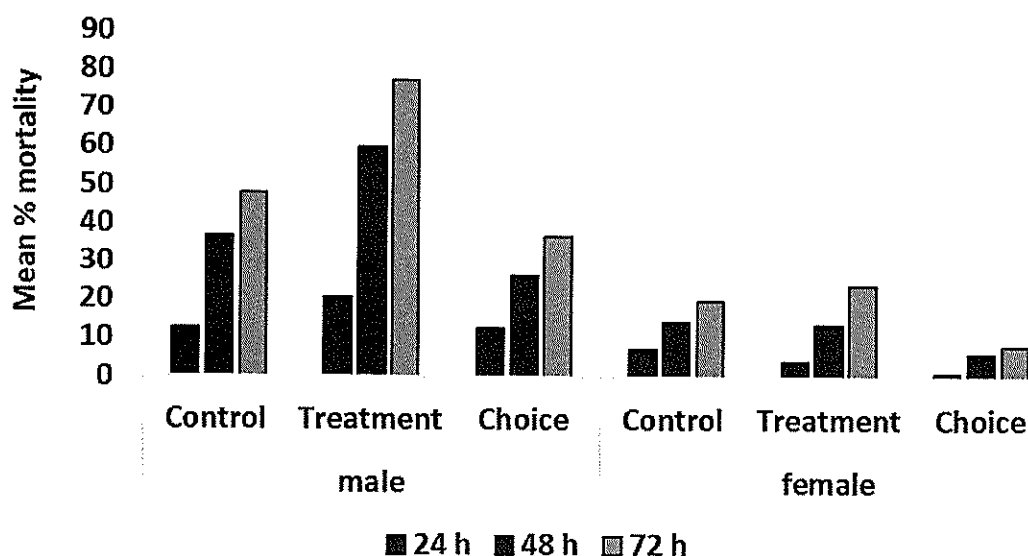


Figure 1. Cumulative mortality of *Aedes albopictus* exposed to Spartan Mosquito Eradicator in comparison to control mortality at different time periods under laboratory conditions

hydrated Spartan Mosquito Eradicators likely have been more saturated with water vapor than control bug-dorms, thus allowing better survival of mosquitoes.

In the field study, dead mosquitoes were found only once in one treatment tube (2 *Ae. albopictus* and 1 *Anopheles quadrimaculatus*). *Ae.*

albopictus collected in BG traps did not show any evidence of reduction in abundance in both males and females (Figure 2). Reductions in the numbers collected in the last two replicates were found in both control and treated sites and could be attributed to environmental conditions. Furthermore, very high abun-

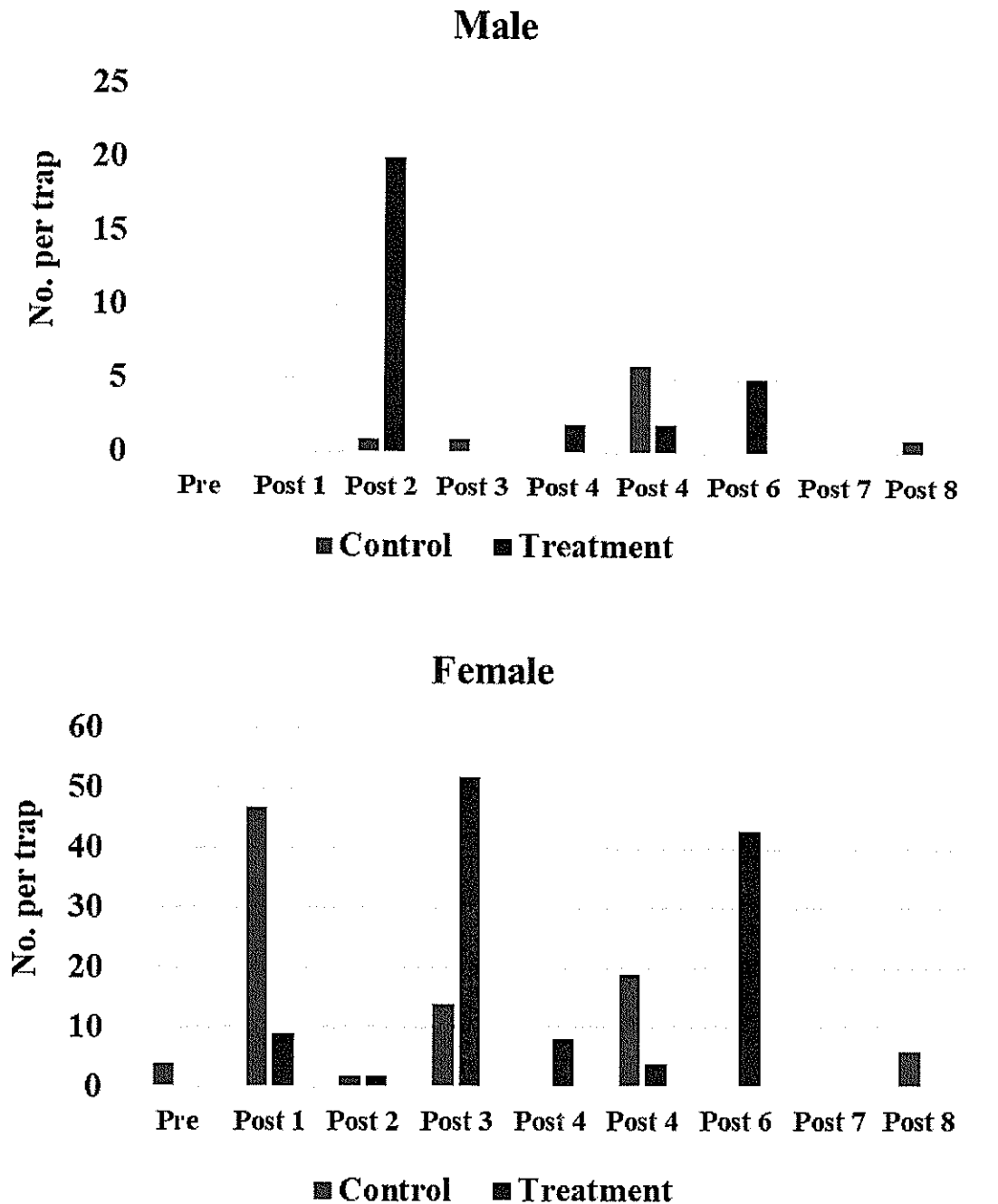


Figure 2. Pre-treatment and post-treatment BioGent Sentinel trap collections of *Aedes albopictus* males and females during the field study

dance of *Ae. albopictus* were casually observed at both sites during each replicate except the last one. Numbers of *Ae. albopictus* males and females collected by BG traps did not show any significant difference between control and treatment sites (Mann-Whitney $U=27$, $p=0.573$ and $U=28.5$ and $p=0.709$, respectively).

Both laboratory and field components of our study show that the Spartan Mosquito Eradicator is not effective in reducing abundance of *Ae. albopictus*. To compete with many alternative sugar sources in the natural environment the product should be more attractive and the device should be modified so that the mosquitoes can reach the product easily and feed on it. A separate study should be carried out to evaluate the effectiveness of the active ingredient at the concentration (1% sodium chloride) used in the dissolved product.

ACKNOWLEDGEMENTS

Authors would like to acknowledge K. Blore for rearing mosquitoes, R. Weaver, for the technical help during the study, J. Hainze for reviewing /editing the manuscript, and BioOus, LLC for providing the commercial products for the testing. This is a research report only and does not mean that AMCD endorses any commercial product.

REFERENCES CITED

- Blore K, Beier J, Xue RD. 2018. Impact of three species of aquatic plants on *Anopheles quadrimaculatus* and its effect on the efficacy of boric acid sugar baits. *J Am Mosq Control Assoc.* 34: 50-52
- Bidlingmayer WI, Hem DG. 1973. Sugar feeding by Florida mosquitoes. *Mosq News.* 33, 535-538
- Deming R, Manrique-Saide P, Medina Barreiro A, Cardena EU, Che-Mendoza A, Jones B, Liebman K, Vizcaino L, Vazquez-Prokopec G, Lenhart A. 2016. Spatial variation of insecticide resistance in the dengue vector *Aedes aegypti* presents unique vector control challenges. *Parasite. Vectors* 9: 67
- Fiorenzano JM, Koehler PG, Xue RD. 2017. Attractive Toxic Sugar Bait (ATSB) For Control of Mosquitoes and Its Impact on Non-Target Organisms: A Review. *Int J Environ Res Public Health.* 14: 398. doi: 10.3390/ijerph14040398
- Foster WA. 1995. Mosquito sugar feeding and reproductive energetics. *Annu Rev Entomol.* 40, 443-474
- Lea, AO. 1965. Sugar-baited insecticide residues against mosquitoes. *Mosq News.* 25, 65-66
- Kraemer MU, Sinka ME, Duda KA, Mylne AQ, Shearer FM, Barker CM, Moore CG, Carvalho RG, Coelho GE, Van Bortel W, Hendrickx G, Schaffner F, Elyazar IR, Teng HJ, Brady OJ, Messina JP, Pigott DM, Scott TW, Smith DL, Wint GR, Golding N, Hay SI. 2015. The global distribution of the arbovirus vectors *Aedes aegypti* and *Ae. albopictus*. *Elife.* 4:e08347. doi: 10.7554/eLife.08347
- Kumari R, Kumar K, Chauhan LS. 2011. First dengue virus detection in *Aedes albopictus* from Delhi, India: its breeding ecology and role in dengue transmission. *Trop Med & International Health.* 16: 949-954
- Maia ME, Tenywa FC, Hannah NH, Kambagha A, Ashura A, Bakari I, Mruah D, Simba A, Bedford A. 2018. Attractive toxic sugar baits for controlling mosquitoes: a qualitative study in Bagamoyo, Tanzania. *Malaria Journal.* 17:22. doi.org/10.1186/s12936-018-2171-2
- McKenzie BA, Wilson AE, Zohdy S. 2019. *Aedes albopictus* is a competent vector of Zika virus: A meta-analysis. *PLoS one.* https://doi.org/10.1371/journal.pone.0216794
- Monteiro VVS, Navegantes-Lima KC, de Lemos AB, da Silva GL, de Souza Gomes R, Reis JF, Rodrigues Junior LC, da Silva OS, Romão PRT, Monteiro MC. 2019. *Aedes-Chikungunya Virus Interaction: Key Role of Vector Midguts Microbiota and Its Saliva in the Host Infection.* *Front Microbiol.* 10:492. doi: 10.3389/fmicb.2019.00492. e Collection 2019
- Paupy C, Delatte H, Bagny L, Corbel V, Fontenille D. 2009. *Aedes albopictus*, an arbovirus vector: from the darkness to the light. *Microbes Infect. Des.* 11:1177-1185. doi: 10.1016/j.micinf.2009.05.005. Epub 2009
- Paupy C, Kassa Kassa F, Caron M, Nkoghé D, Leroy EM. 2012. A chikungunya outbreak associated with the vector *Aedes albopictus* in remote villages of Gabon. *Vector Borne and Zoonotic Diseases.* 12: 167-169. doi: 10.1089/vbz.2011.0736
- Qualls WA, Muller GC, Revay EE, Allan SA, Arheart KL, Beier JC, Smith ML, Jodi M. Scott JM, Kravchenko VD, Hausmann A, Yefremova ZA, Xue RD. 2014. Evaluation of attractive toxic sugar bait (ATSB)—barrier for control of vector and nuisance mosquitoes and its effect on nontarget organisms in sub-tropical environments in Florida. *Acta Trop.* 131: 104-110. doi:10.1016/j.actatropica.2013.12.004
- Qualls WA, Muller GC, Traore SF, Traore MM, Arheart KL, Doumbia S, Schlein Y, Kravchenko VD, Xue RD, Beier JC. 2015. Indoor use of attractive toxic sugar bait (ATSB) to effectively control malaria vectors in Mali, West Africa. *Malaria Journal* 14:301. doi.org/10.1186/s12936-015-0819-8
- Sivan A, Shriram AN, Sugunan AP, Anwesh M, Muruganandam N, et al. 2016. Natural transmission of dengue virus serotype 3 by *Aedes albopictus* (Skuse) during an outbreak in Havelock Island: Entomological characteristics. *Acta Tropica.* 156:122-129. doi: 10.1016/j.actatropica.2016.01.015
- Stewart ZP, Richard M. Oxborough RH, Tungu PK, Matthew J. Kirby MJ, Rowland MW, Seth R. Irish SR. 2013. Indoor Application of Attractive Toxic Sugar Bait (ATSB) in Combination with Mosquito Nets for Control of Pyrethroid-Resistant Mosquitoes. *PLoS one* 8 (12): e84168
- Xue RD, Kline DL, Ali A, Barnard DR. 2006. Application of boric acid baits to plant foliage for adult mosquito control. *J Am Mosq Control Assoc.* 2006:497-500.
- Xue RD, Barnard DR. 2003. Boric acid bait kills adult mosquitoes. *J Econ Entomol.* 96:1559-1562.

EXHIBIT C

Hattiesburg man invents product to control mosquitoes



May 12, 2017 at 11:52 PM CDT - Updated August 12 at 8:31 AM

HATTIESBURG, MS (WDAM) - A Hattiesburg man has invented a \$20 product he says eradicates mosquitoes for 90 days.

Jeremy Hirsch, president and co-founder of Hattiesburg-based Spartan Mosquito, said the product has been in the works for almost four years.

"Up to this point, all mosquito control measures were kind of a prophylactic, if you will," Hirsch said. "They didn't really kill the mosquito, so we took what they were doing in Africa, experimentations and things that had been used. We kind of improved upon that over the last three and a half years, and we came up with something that's very simple, very easy to use."

Spartan Mosquito eradicators are tubes sold in sets of two for about \$20. Hirsch said the ingredients inside are like a sugar cookie, without the flour.

"All you have to do is fill it up with water to here," Hirsch said demonstrating. "You put a cap on. You hang it in a tree, and you don't have any mosquitoes for 90 days."

Hirsch said the water starts a chemical reaction inside the tube that releases carbon dioxide to mimic a human or an animal breathing. That reaction, the sugar and the dark color of the tube attracts the mosquitoes. Two tubes cover a square acre of land for about three months before they need to be replaced.

"We tested it from the Atlantic to the Pacific and beyond," Hirsch said. "From the marshes in Florida to the bayous in Louisiana, and everywhere we test, it works phenomenal."

It's already been effective in one Pine Belt County. When Lamar County reported a Zika case last year, officials contacted Spartan Mosquito.

"They actually put up the mosquito bombs around the perimeter where the virus was identified," said Jody Waits, Lamar County administrator. "When we first went on site, we did a count that showed it was a landing rate that was high. I mean, you could sit there and just swat the mosquitoes away. Within two weeks, there was virtually no mosquitoes, so we found it worked very well."

Hirsch said, "The initial count at the Zika site was 27 when we responded, and two weeks later, that count was zero. It remained at zero for the following three months, and, to date, that's the most successful response to Zika anywhere in the world on record."

Hirsch said his biggest hurdle has been skepticism, and even Waits had his doubts until he saw the results.

"What they said worked, and if I hadn't seen it with my own eyes, I wouldn't have believed it," Waits said. "You know, mosquitoes around here are pretty bad. I've bought two. They're in my yard right now, and we virtually have no problem."

Lamar County has a contract to purchase additional tubes because the first set worked so well.

"Going forward, we have an order pending them," Waits said. "They're finalizing some EPA stuff that they need. Once they get that finished, which I think that's been done this week, we're going to put them at our ball fields and parks within the county because it really was rather amazing what it did."

Hirsch said users should place the mosquito bombs on the edges of their property, so mosquitoes aren't being attracted and swarming to an area near people.

"Anyone can use this from municipalities to governments to parks to homes, and residential is really what we care about the most," Hirsch said. "It's really nice that we can partake at a government level, but it was founded to keep my family safe. The point of this is to keep everybody's family safe."

Right now, the company is able to sell the mosquito bombs in nine states and Puerto Rico. Hirsch said the product could be available for online purchase in Mississippi as early as Monday.

Copyright WDAM 2017. All rights reserved.



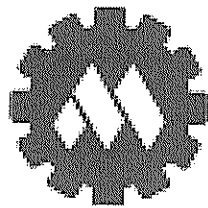
83° 
Currently in
Hattiesburg, MS
FULL FORECAST

Sponsored By

RECENT CONTENT



EXHIBIT D



MANUFACTURED IN MISSISSIPPI

(<https://www.manufacturedinmississippi.com/>)

601.707.8350 (tel:16017078350)

Menu

Spartan Mosquito Eradicator

by Bryan Carter



New Mississippi invention, the Spartan Mosquito Eradicator, devastates mosquito populations simply and affordably. Two Spartan Mosquito Eradicators cover approximately one acre, last 90 days, and sell for about 20 dollars per pair.

Contact Spartan Mosquito
1.844.625.2742 (tel:+1-844-625-2742)

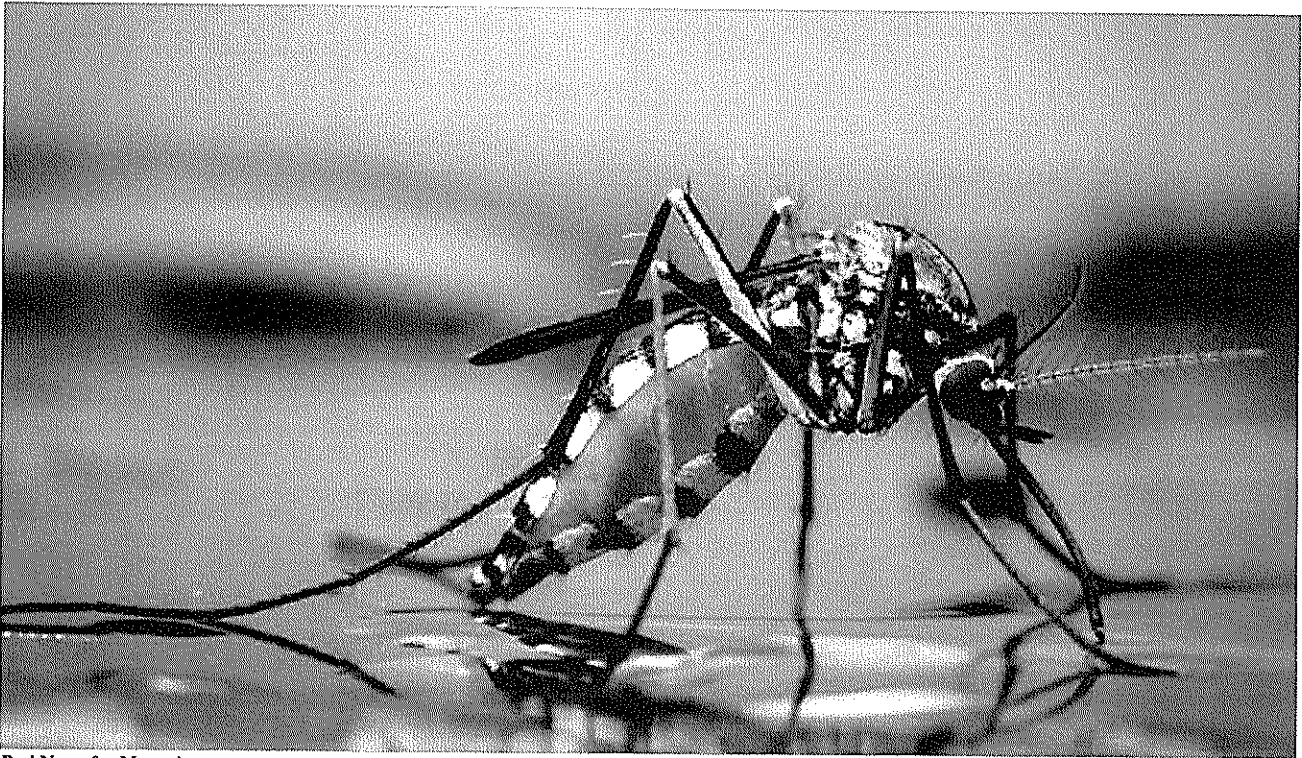
[www.spartanmosquito.com](http://spartanmosquito.com) (<http://spartanmosquito.com>)

Inspiration for Invention

One summer afternoon in Hattiesburg, Mississippi, a husband decided that he was not okay with his pregnant wife having to soak herself in bug repellent. He had cause to be worried about mosquitoes. West Nile disease was actively being spread by mosquitoes in Mississippi.

Jeremy Hirsch, founder of Spartan Mosquito, began reading about mosquito control techniques being pioneered in Africa by the Gates Foundation and others. He had noted the criticisms of the solutions being temporary. In many cases, product duration was determined by the next rain since it washed the products away.

Later, Hirsch watched a hearing in congress where a repellent company's response to the Zika outbreak was to ramp up the manufacturing of its existing repellent to 24 hours a day (and sell more product). Keep in mind that repellents do not kill mosquitoes, they only hope to keep mosquitoes at bay. He thought to himself, "I can do better." And, he did.



Bad News for Mosquitoes

Out of frustration, and then inspiration, came innovation. After many months of researching and prototyping new device ideas, Hirsch invented the Spartan Mosquito Eradicator. This device stands to revolutionize the mosquito control industry world-wide. The Spartan Mosquito Eradicator attracts hunting mosquitoes by emulating attractors of their natural prey — animals and people. Once the mosquitoes feed, they die. Female mosquitoes feed just before they lay eggs, which means the breeding cycle is also broken. The result is a solution that decimates the mosquito population within the range of the devices, with two devices covering about an acre. This innovative concept stands to change the way people manage mosquitoes.

Success Criteria

According to Hirsch, the solution had to be effective, easy, affordable, long-lasting, and as safe as possible. The inventor created a device that only requires the user to add warm water and hang it in the shade. Studies show that the device, once activated, provides greater than 95% mosquito control for 90 days.

To date, the device has been tested in both formal and informal environments from the swamps of Florida to the bayous of Louisiana, on the Mississippi coast, in the Mississippi delta, and even in a Zika control area. In every case, mosquito "hits" (mosquito bites or landings) are reduced to near zero, or zero, within weeks or even days.

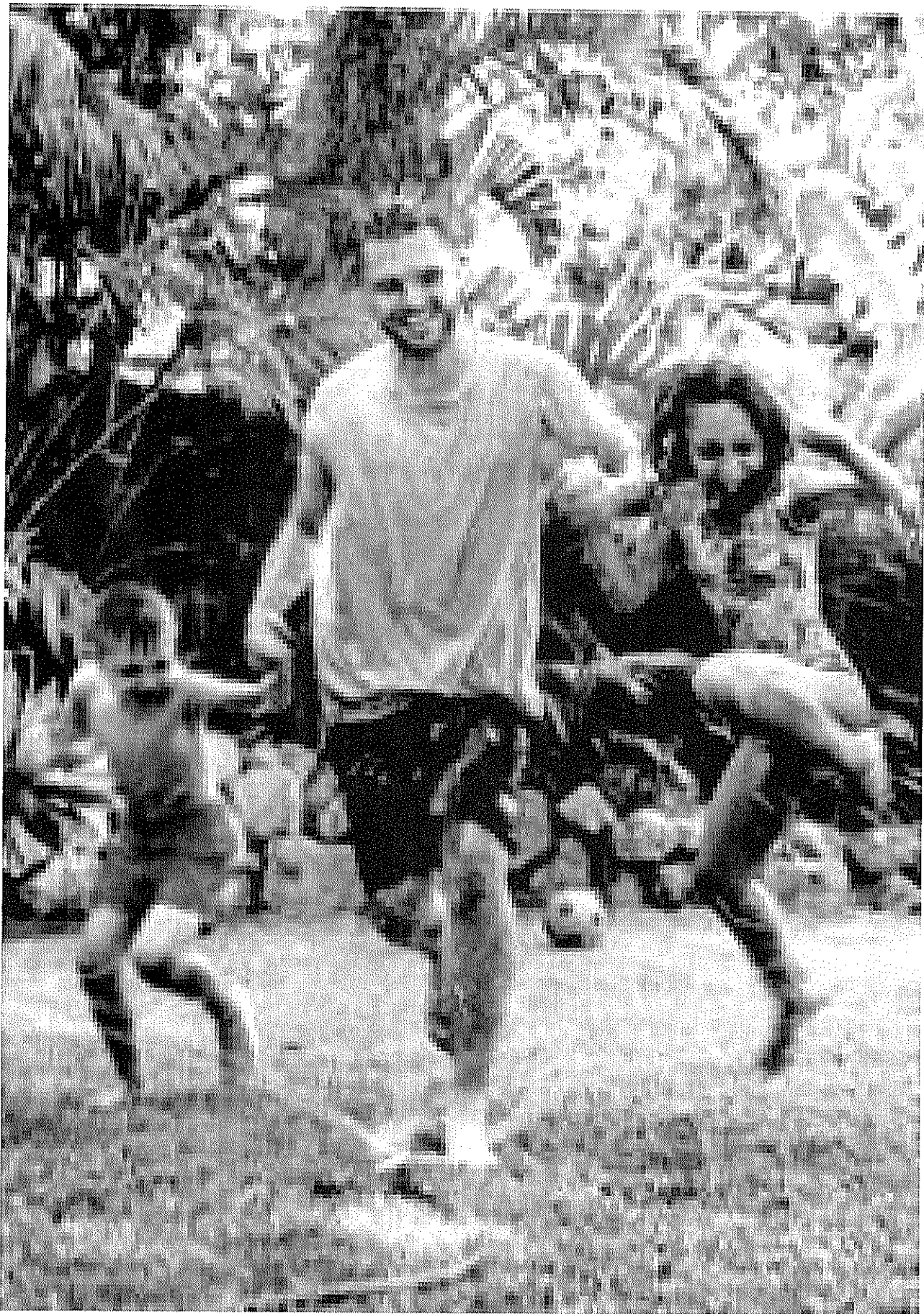
The biggest wins for the customer are the effectiveness and the price point, making it a product for the masses. Consumers get two units for around \$20, which control approximately one acre and last 90 days. That is a fraction of the price of many mosquito control services and solutions.

Price point is also an advantage in taking the product to market. Hirsch says, "By bringing a product to market that is better than sprays, repellents, candles, and repellent services, at a price point that is a fraction of the cost of professional spray services, we have opened up the market. We just received approval to sell in 10 states, including our home state of Mississippi, and began sales the same day we received approval. The response has been overwhelming after only a week. The phones are ringing off the hook and the website traffic is outrageously high. People desperately want and need this product."

Solutions for Success

Spartan has perfected two solutions.

The first solution, available now in select states, uses sodium chloride as an active ingredient. As a result, they have the same basic active ingredients as sugar



cookies.

The second formula uses boric acid as the active ingredient and only contains a fraction of boron or boric acid content found in direct contact products such as eye washes, talcum powders, soaps, shampoos, and even Silly Putty®. This second solution is pending EPA approval before it can be sold to the public.

The devices are also designed to not harm honey bees, addressing the important issue of bee protection for farmers and environmentalists.

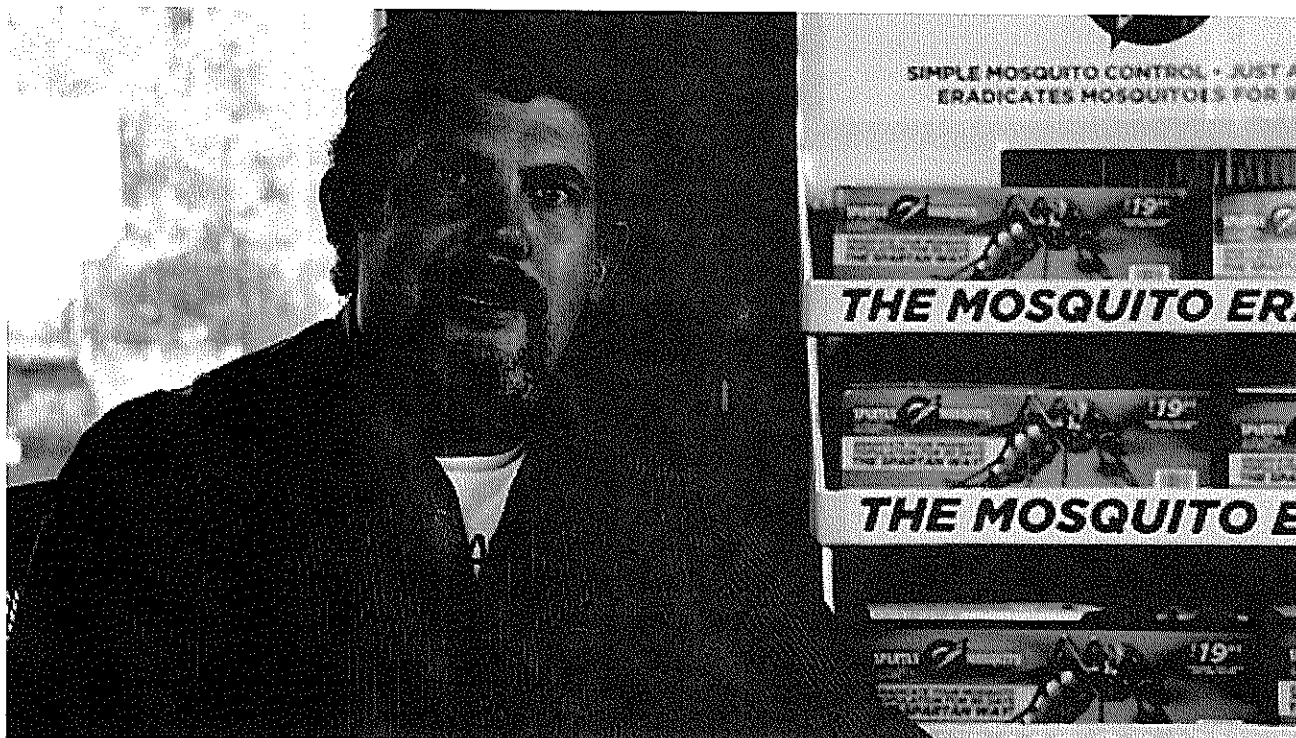
Getting to Market

Spartan Mosquito is working diligently to make the Spartan Mosquito Eradicators widely available to the public in major retail outlets and to world health organizations, government organizations, and nongovernment organizations worldwide, but they have to go through all of the channels for approval both at home and abroad. Hirsch is attempting to get an early greenlight because mosquitoes are so dangerous and his product has ingredients at levels that have already been deemed safe by the EPA in other products.

In the meantime, mosquitoes are carrying viruses, parasites, and diseases including the Zika virus, West Nile virus, and Malaria, and are actively transmitting them to people.

On a Mission

The devastation mosquitoes bring to families, loved ones, and people of all ages is happening now. The company goal is to help prevent the powerfully negative effects of mosquitoes on people in the United States, and in mosquito infested communities abroad as quickly as possible, and many government officials are supporting the product.



Positioned to Succeed

This Mississippi manufacturer has found a way to help people with a device that works and is simple to use. They are positioned to corner the market with a product that addresses a common and serious problem, is easily accessible, and has a low cost point and simple distribution plan. They are rapidly taking orders and scaling their manufacturing.

Spartan Mosquito is a Mississippi business with a heartfelt mission and a strategy to succeed. Using the indicators of public response, market viability, critical demand, and accessible pricing, they are well positioned to be Mississippi's next successful international, multimillion-dollar manufacturing company — and save lives in the process.

Spartan Mosquito is the manufacturer of the Spartan Mosquito Eradicator. The Spartan Mosquito Eradicator decimates mosquito populations easily and affordably, for about 20 dollars for three months for one acre — reducing mosquito bites and landings by 95%. Spartan Mosquito Eradicators are available for ordering online and expect to be in retail locations beginning in June 2017. For more information, visit www.spartanmosquito.com (<http://spartanmosquito.com>).

Contact Spartan Mosquito

1.844.625.2742 (tel:+1-844-625-2742)

www.spartanmosquito.com (<http://spartanmosquito.com>)

« Previous Article

(<https://www.manufacturedinmississippi.com/2017/06/01/planning->

Back to Top

Next Article »

(<https://www.manufacturedinmississippi.com/2017/06/01/hinds->

EXHIBIT E



Distributors Buy Out Entire Spartan Mosquito Production Before Mosquito Season Begins

It is only April and Spartan Mosquito, makers of the Spartan Mosquito Eradicator, have already sold out of their entire year of planned production for 2019. Mosquito season has not even started for most of the country.

LAUREL, Miss. (PRWEB) April 16, 2019 -- It is only April and Spartan Mosquito, makers of the Spartan Mosquito Eradicator, have already sold out of their entire year of planned production for 2019. Mosquito season has not even started for most of the country.

Spartan Mosquito launched Spartan Mosquito Eradicators for retail sale in 2017 with “mom and pop” stores in just a few states. The company was selling in retail stores in all but three states in 2018, and also launched online sales. This year, 2019, the company is fighting to keep up with demand for product and is fervently working to increase production for 2020.

Spartan Mosquito Eradicators are tubes that are filled with warm water which mixes with the solution inside, and are then hung on the perimeter of the yard or property. Mosquito populations are decimated with up to a sustained 95% control rate in just a few weeks when deployed as directed. The tubes last up to 90 days.

The company was one of the fastest growing companies in 2018 and experienced a growth rate of over 800% in Q1 2019 over Q1 2018.

Spartan has announced that they will begin taking pre-orders for the 2020 season at the National Hardware Show in Las Vegas from May 7-9, 2019, with first scheduled delivery on December 1, 2019.

Product will be available in retail markets supplied by the distributors and from the following Sponsored Partners until they run out. For those who need product before December 2019, Spartan recommends contacting the following Sponsored Partners.

For Distributors:

<https://www.durvet.com/distributor-members/>

Brian A. Johnson: BrianJ@durvet.com

Todd Muenstermann: ToddM@durvet.com

Mike Gallagher: MikeG@durvet.com

1-800-821-5570

For Retailers:

<https://wdgholdings.com/>

Stan White: info@wdgholdings.com

1-877-636-6413

For Consumers:

<https://buyspartanonline.com/>



Contact Information

Bryan Carter

Think Webstore

<http://thinkwebstore.com>

+1 (601) 856-2000

Online Web 2.0 Version

You can read the online version of this press release [here](#).